United States
Department of Agriculture

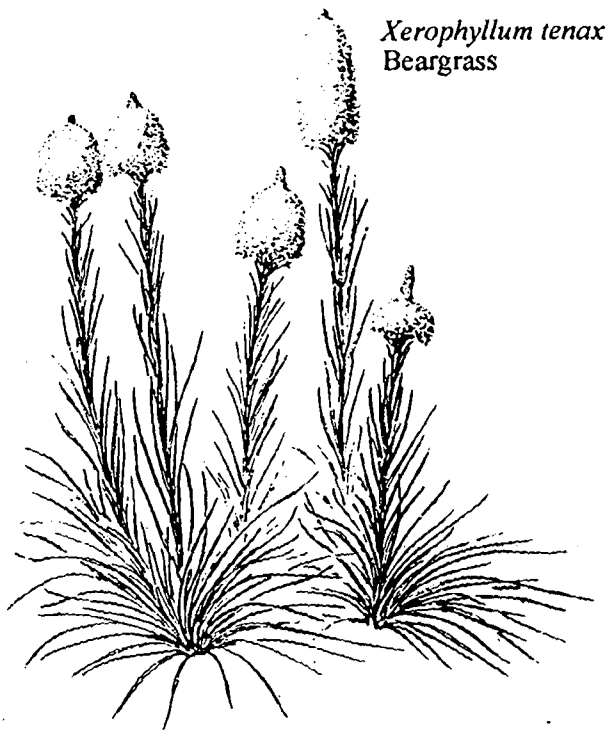
Forest Service

**Pacific
Northwest
Region**

R6-NR-TP-16-96

EARLY SERAL PLANT COMMUNITIES

Pacific Silver Fir Zone
Mt. Hood National Forest



Xerophyllum tenax
Beargrass

United States
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EARLY SERAL PLANT COMMUNITIES

Pacific Silver Fir Zone
Mt. Hood National Forest

By

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Introduction

Management of National Forest lands requires that we are able to accurately measure or estimate the land's response to management activities and other actions. Since the early 1980's, management on the Mt. Hood National Forest has been enhanced by the development of vegetation plant association guides, such as the Plant Association and Management Guide for the Pacific Silver Fir Zone, Mt. Hood and Willamette National Forests (Hemstrom et al, 1982). These guides have helped to classify forest communities, and better estimate their inherent productivity, and responses to management and other disturbance activities.

Plant Association Management Guides are based on mature forests, in which the vegetative composition has stabilized, resulting in a long-term stable plant association, or climax community. Different environments will have different vegetation, and similar environments across the landscape will have similar vegetation, at this late-successional or "climax" stage.

Following disturbance, such as timber harvest activities or wildfire, this stable community of plants is disrupted. Disturbance activities may result in increased solar radiation, affecting temperature and moisture regimes. Plant removal and soil disturbance changes the plant composition of the site, and alters the conditions affecting seedling establishment. Wildlife populations and composition are also affected by habitat changes. The resulting early-seral community is very different, and much more dynamic, than the pre-disturbance plant association.

The Mt. Hood National Forest contains thousands of acres in these "early seral" stages. Clearcuts and other timber harvest areas, wildfires, and other areas heavily disturbed in the past 40 or more years are occupied by a wide variety of vegetation types and ecological stages. Determination of a particular site's plant association is difficult on these sites; the vegetational composition has usually been altered a great deal, and may continue to change over time. A site's plant association may be estimated by using a nearby, undisturbed forest stand, or by applying an educated guess from existing vegetation. However, determination of the plant association, and thus the inherent site characteristics, is much more inexact.

There is a need, however, to classify and understand early seral vegetation, and how early seral communities relate to stable, long-term plant associations. Young forest stands may need to be managed for timber production, as wildlife habitat, or for domestic forage. There may be a desire to manage understory vegetation to produce other forest products, such as beargrass, huckleberries, or mushrooms. Managers may want to develop structural or compositional heterogeneity in a young stand, to maintain forage production or aesthetic values.

Objectives of the Guide

This guide is intended to assist Forest personnel in managing early seral stands within the Pacific Silver Fir Zone of the Mt. Hood National Forest, by providing descriptions of early seral plant communities, linking them (when possible) to Mt. Hood National Forest Plant associations, and identifying some management considerations. As with all guides, it also provides managers with a framework within which to categorize their own experiences, and develop recommendations based on managerial experience.

Classification Concepts

Study of early Forest succession in the Cascades of western Oregon and Washington has been conducted relatively recently. Franklin and Dyrness (1973) noted that, at that time, early stages in forest succession had not been studied in detail. Work since that time, along with biological information regarding the common tree, shrub, and forb plants of early seral forests, enables us to draw a general picture of early forest succession.

Early forest succession can take numerous paths. Traditional concepts describe a sequence of low-growing herbs dominating early succession, followed by tall shrubs, which are eventually replaced by trees. Franklin and Dyrness (1973) noted that, generally, early seral sites in the Pacific Silver Fir Zone may initially be dominated by residual species, persisting from the pre-disturbance forest, rather than being dominated by new, colonizing species. Or, as work in similar sites of the Oregon Cascades show, (Schoonmaker and McKee, 1988), late seral species may initially be virtually eliminated, rebounding over the course of several years. Work by Halpern (1988) and Halpern & Franklin (1990) further refine the development of similar Douglas-fir forests after disturbance. They found that the pre-disturbance community structure, and the intensity of disturbance are major determinants of succession. They also noted that the dynamics are complex, and may be altered by such things as limited seed availability and local weather fluctuations. The sequence of succession in early seral forests can be complex and variable.

Despite this complexity, Halpern (1989) mentions two commonly described patterns for secondary succession[1]:
(1) Most species either survive disturbance, or colonize shortly thereafter.
(2) Long-term changes in composition occur through gradual expansion and decline of species, rather than through sequential recruitment and replacement.

Simply put, early successional stages may be dominated by species that colonize the site shortly after disturbance, or by species that survive the disturbance. And, the changes that occur during early succession are usually not abrupt, rather one of gradual expansion or decline.

The Pacific Silver Fir Zone, Mt. Hood National Forest

The Pacific Silver Fir Zone, on the Mt. Hood National Forest, is found at elevations ranging from 3,000 to 5,000 feet. The zone is characterized by wet winters, with deep snow accumulations, and relatively dry summers. The zone blends, at lower elevations, with the Western Hemlock Zone in the western Cascades, and with the Grand Fir Zone on the east. At higher elevations, the Pacific Silver Fir Zone borders the Mountain Hemlock Zone. Vegetation within the Pacific Silver Fir Zone is quite variable; the Plant Association Guide for the Pacific Silver Fir Zone, Mt. Hood and Willamette National Forests (Hemstrom et al, 1982) identified 16 Pacific Silver Fir Zone plant associations, ranging from moist, highly productive forests to marginally productive, high elevation associations. Mature forest stands are composed of Pacific silver fir, associated with western hemlock at lower elevations, and with mountain hemlock at higher elevations, and with noble fir, Douglas-fir, and western white pine. Seral stands are composed of a variety of species, with some difference being expressed in the two major physiographic divisions in the zone (dissected old Cascades to the west, rolling high Cascades to the east). The composition of seral stands in the old Cascades often resembles that of Douglas-fir forests at lower elevations in the western hemlock zone, while seral stands in the high Cascades contain species characteristic of more interior forests, such as subalpine fir, lodgepole pine, western white pine, and western larch (Halverson and Emmingham, 1982).

A detailed physical and biological description of the Mt. Hood Pacific Silver Fir Zone is included in the Plant Association Guide for the Pacific Silver Fir Zone, Mt. Hood and Willamette National Forests (Hemstrom et al, 1982). Additional information, along with regeneration recommendations, is included in "Reforestation in the Pacific Silver Fir Zone of the Cascades in the Willamette, Mt. Hood, and Gifford Pinchot National Forests". (Halverson and Emmingham, 1982).

Early Seral Stands in the Pacific Silver Fir Zone

Most early seral stands within the Pacific Silver Fir Zone on the Mt. Hood National Forest (and all of the stands that supplied data used in this guide) originated from regeneration harvests, usually clearcutting. Most of these managed stands are 40 years old or less; stands from which data for this guide was gathered range in age from 7 to 46 years. Tree species occurring in these stands, and stocking level of trees varies a great deal, due both to site factors, and to management (species selected for planting). Although Douglas-fir is often the dominant species, colder sites (i.e. flat, frost-prone areas) are often dominated by lodgepole pine, western white pine, or Engelmann spruce. Higher

[1] *Secondary succession* refers to succession following disturbance that disrupts rather than destroys an existing biotic community. *Primary succession* refers to the development of biota on unoccupied sites (Spurr, 1964).

elevation sites may include a greater component of advance regeneration (usually Pacific silver fir). Numerous other species are present in smaller numbers, having also been regenerated by planting, or coming in as natural regeneration.

Many early seral shrub and forb species can be classified as "residuals", species that persist from the pre-disturbance forest, or "invaders", species that colonize newly disturbed sites. Schoonmaker and McKee (1988) categorize species as "residual" or "invading" for a study in the western Oregon Cascades; their list includes most of the species included in early seral forests in the Mt. Hood Pacific Silver Fir Zone. The presence (or absence) of some species may help interpret the management history of the site. A strong presence of snowbrush (*Ceanothus velutinus*) for example, indicates a strong influence of fire, allowing snowbrush to become well established. Snowbrush, a colonizing species, will decrease over time as trees shade the site.

Table 1 lists some of the more important early seral shrub and forb species, along with some ecological information about each.

Wildlife Habitat Relationships

Harvest or other disturbance reduces habitat for some species and creates habitat for other species. Wildlife species have adapted to different structure stages that occur as succession proceeds. In general, wildlife species respond to structural changes in vegetation more than compositional changes. An exception is that certain plants will attract wildlife because of the high quality forage provided. Early seral communities in the Pacific Silver Fir Zone provide important structural attributes that attract a variety of wildlife species. Grasses, forbs, and shrubs are abundant in open habitats and produce high quality forage for herbivores. Shrubs are important habitat structure providing hiding and thermal cover, nest sites, and foraging habitat for a variety of wildlife. Shrubs provide important habitat for forage-gleaning, insectivorous wildlife. Berry production from shrubs is often greater in more open habitats, even for those plants that also occur in later seral communities. Because shrubs are retained in most seral stages, a number of species associated with shrubs are generalists. In later seral communities they are often associated with gaps in the canopy. The openness of early seral communities makes them good hunting areas for predatory birds and mammals. Prey is easy to see and tree canopies do not hinder flight. The open habitat is also important for insectivorous wildlife that forage in the air, including bats, swallows, nighthawks, flycatchers, and swifts.

Wildlife-to-structure stage relationships for western Oregon and Washington are summarized in Brown (1985). The Pacific Silver Fir Zone equates to Brown's (1985) high temperate coniferous forest community. Sites in this zone typically have a winter snowpack that covers forage, makes travel difficult, and provides a harsher winter environment. As a result, some species are precluded from using the zone during winter. The Pacific Silver Fir Zone does provide big game summer range. The zone is also used for spring/fall range at the lower elevations. Neotropical migratory birds use habitats in the zone during the spring and summer breeding season. Some other species have adapted to the harsher climate and remain year round.

The early seral communities covered in this guide fall into several of Brown's (1995) stand conditions. Generally, the early seral communities occur on sites where it has been 5-35 years since disturbance. Most plots in the early seral communities fell in the shrub and open sapling-pole stand conditions. Occasionally a plot would fall on a site in the closed sapling-pole-sawtimber stand condition. The grass-forb stand condition usually lasts 2-5 years after disturbance and thus is a very transitory stage; plots rarely fell in this stand condition.

Appendix 3 lists the wildlife species occurring in the Pacific Silver Fir Zone on the Mt. Hood National Forest. Early seral stand conditions used for breeding and feeding are indicated. A number of species use the early seral habitats just for feeding. Many of these species feed in open habitats but breed and/or nest in larger trees or snags in later seral forests. Examples of these species include red-tailed hawk, great horned owl, pileated woodpecker, and many bats. Many amphibians occur in seral habitats but must return to water to breed. A number of species are generalists that will use a wide variety of stand conditions including the early seral conditions. These species include crow, raven, grouse, robin, thrushes, hummingbirds, vireos, deer mouse, coyote, black bear, deer, tree frogs, and several salamanders. There are several species that occur just in early seral or open habitats, or reach their peak

Table 1
Ecological Characteristics of some important early seral plants
Pacific Silver Fir Zone, Mt. Hood National Forest

Species	Longevity	Reprod/dispersal	Colonizer/Residual	Shade tolerance	Comments
Fireweed (Epilobium angustifolium) EPAN	Perennial	windblown seed, rhizomes	Colonizer	Intolerant	Important early colonizer; establishes readily from seed on mineral soil. Then, spreads/maintains by rhizomes.
Pearly Everlasting (Anaphalis margaritacea) ANMA	Perennial	windblown seed, rhizomes	Colonizer		Important colonizer, establishes readily from seed
Woods Strawberry (Fragaria vesca) FRVE	Perennial	Animal-dispersed seed, stolons	Colonizer	Moderate	
Broadpetal Strawberry (Fragaria virginiana) FRVI	Perennial	Animal-dispersed seed, stolons	Colonizer	Moderate	
Broadleaf lupine (Lupinuslatifolius) LULA	Perennial	Seed			
Bracken fern (Pteridiumaquilinium) PTAQ	Perennial	rhizomes, wind-dispersed spores. *Mostly vegetative*	Colonizer	Intolerant	Important colonizer; allelopathic to some other plants; frost-sensitive in spring, usually does not do well on frost-prone sites. Does best in open, but may persist in open areas of older forests.
Pinemat manzanita Arctostaphylos nevadaensis ARNE	Perennial	soil-stored seed following fire, root sprouts	Colonizer	Intoleraant-moderate	Indicates cold, dry sites; requires fire to break seed dormancy
Vine maple (Acer circinatum) ACCI	Perennial	Sprouts from root crown, layering, seed	Residual	Does best in open, persists in shade	Resprouts following fire; valuable for wildlife (browse, seeds); eaten by cattle & sheep; valuable as ornamental
Dwarf Oregon grape (Berberis nervosa) BENE	Perennial	Seed, rhizomes	Residual	Tolerant	Usually on warm, dry sites in PSF zone; decreases after disturbance, but sprouts from underground rhizomes.

Species	Longevity	Reprod/dispersal	Colonizer/Residual	Shade tolerance	Comments
Chinquapin (Castanopsis chrysophylla) CACH	Perennial	Seed and vegetative (basal sprouts); mostly vegetative	Residual	Moderate	Persists in mature stands; increases following disturbance. Fire kills above-ground stems, and the plant regrows from basal srpouts.
Princes' pine (Chimaphila umbellata) CHUM	Perennial	Both vegetatively and from seed	Residual	Moderate	Occurs in many stand ages; common understory component of old-growth and climax forests in the northwest; fire-sensitive, declines strongly after fire, depending on fire severity.
Oregon boxwood (Pachistima myrsinites) PAMY	Perennial	Seed, layering	Residual	Tolerates both sun and shade	Survives cool fires, may be killed by hot fires. Resprouts from root crown. Valuable as ornamental./ground cover
Trailing blackberry (Rubus ursinus) RUUR	Perennial	Vegetative (root and stem suckers); Seed (animal dispersal)	colonizer/residual	Grows best in open, but tolerates shade	Trailing blackberry is a vigorous competitor which commonly invades disturbed sites created by logging, fire, or other types of disturbance. Edible berries
Rhododendron (Rhododendron macrophyllum) RHMA	Perennial	Vegetative (sprouts from stem base or root crown), seed	Residual	Tolerates sun and shade	Occupies poor sites; decreases following fire, partially recovers with time.
Alaska huckleberry (Vaccinium alaskaense) VAAL	Perennial	Vegetative (rhizomes), seed (animal dispersed)	Residual	Tolerates sun and shade	Fruit edible by wildlife and people; Best development in sun, partially-open mature stands; increases following disturbance from rhizomes; severe fires may kill underground portions of plant
Big huckleberry (Vaccinium memranaceum) VAME	Perennial	Vegetative (rhizomes), seed (animal dispersed)	Residual	Tolerant of sun and shade; best development in sun	Fruit edible by wildlife and people;; important recreationally in NW; common huckleberry of high-cascades "berry fields"; increases following disturbance (other than hot fires)
Queencup beadlily (Clintonia uniflora) CLUN	Perennial	Rhizomes, seed	Residual	Tolerates sun and shade; reaches best development in shade	Associated with warm, moist sites; sprouts from rhizomes following fire
Twinflower (Linnea borealis) LIBO2	Perennial	Rhizomes, seed	Residual	Tolerates sun and shade	Does not tolerate fire; sometimes colonizes disturbed areas via rhizomes, from residual populations
Dogwood bunchberry (Cornus canadensis) COCA	Perennial	Rhizomes, seed	Residual	Tolerates sun and shade; best development in shade	
Beargrass (Xerophyllum tenax) XETE	Perennial	Vegetative (rhizomes), seed	Residual	Moderately shade tolerant. Grows but seldom blooms under a forest canopy	Re-establishes via rhizomes after fire, may be killed by hot fire. sensitive to competition from shrubs following disturbance; frost-tolerant, may occupy frost-prons sites; used by native americans for baskets; valuable as floral greenery; native americans use for basket making

abundance in these areas. Those species include mountain quail, common nighthawk, bluebirds, many sparrows, ground squirrels, gophers, red fox, skunks, marmots, and most reptiles.

Snags, down wood, rock and talus are habitat features that are important component of habitat for many species. Appendix 3 indicates which species use or require these habitat features. Some species use habitat features independently of the surrounding vegetation, while others use habitat features only within specific communities and stand conditions. A couple of examples follow. Mountain bluebirds use only open habitats and only when snags are present for nest sites. Hairy woodpeckers require snags for nesting and feeding but will use snags in a variety of stand conditions. Pikas only occur where there are talus slopes in open areas. Clouded salamanders occur in a variety of stand conditions but only if large logs are present.

Most sites in the early seral communities were harvested prior to implementation of standards and guidelines requiring snags and logs be left in units following harvest. In addition, many units were burned after harvest by clear-cut. As a result, remnant snags and logs large enough to be used by wildlife were absent or rare on many of the sample sites. Current standards and guidelines that require leaving snags and logs should result in improved habitat conditions for snag and log dependent species. New harvest units and the early seral communities that follow harvest should contain large snags and down wood.

The life form column in Appendix 3, used in conjunction with the life form descriptions in Appendix 4, indicates which components or portions of the community are used for reproducing and feeding. The majority of species are categorized into only four of the life forms -- life forms 5, 11, 14, and 15. Discussions of these four life forms follow. A similar approach can be used for species in the other life form categories.

Those species in life form 5 are ground nesters or breeders and ground foragers. Species include terrestrial salamanders, grouse, quail, juncos, and most reptiles. Hiding cover for breeding and resting is important for these species. Low shrubs, logs, or rocks provide important cover. Those species in life form 11 nest in trees and feed on or in a variety of places. For most of these species pole sized trees present in the early seral communities provide nest sites. These species include flycatchers, jays, robins and thrushes, vireos, and grosbeaks. Those species in life form 14 are cavity nesters that forage on the ground, water, or air. Snags larger than 15 inches need to be present in the early seral community, or very near by, before these species will occur. These species include American kestrel, small owls, Vaux's swift, swallows, chickadees, bluebirds, and many bats. Those species in life form 15 use underground burrows for breeding and forage on the ground. Logs, low shrubs, or rocks provide important hiding cover for these species while they are foraging. Burrow entrances are also often near cover. These species include shrews, moles, mountain beaver, chipmunks, ground squirrels, gophers, coyote, fox, bear, weasels, and skunks.

Use of the Guide

This guide was developed using information from two sampling efforts, Area VII Ecology sampling plots, and Managed Stand Survey (MSS) plots, from the Pacific Silver Fir Zone. Information was collected on environmental variables, and on occurrence of trees, shrubs, and forbs. In addition, information was collected about the management history of the stands in which the plots occurred. A total of 318 plots are represented in the guide.

Individual community descriptions refer to "plots" and to "sites". Managed stand survey information used in the guide often includes 2 or 3 plots that were all within one stand (usually a clearcut). Although they are different data points, they may all represent one clearcut, or "site". The number of "sites" may gives a better picture of the number of different places on the landscape sampled. When only 2 or 3 sites are sampled, caution should be used in interpreting information.

Community descriptions include some information about management history. Although harvest dates are well documented, detailed information regarding logging, slash disposal, and other disturbance methods are in short supply.

"Parent" Plant Associations and Successional Pathways

The ability to link early seral plant communities to plant associations is of great value; inferences and recommendations from plant association guides can be carried to young stand management. Also, knowledge gained from stand management can be used to refine recommendations both for early seral communities, and for plant associations.

Because of the dynamic nature of plant development in early successional stages, incomplete management histories for many sites, and managerial influences (species planted on a site may be a reflection of managerial decisions, not ecological characteristics of a site), determination of a seral community's "parent" plant association is often difficult. The most accurate method to determine plant association is to visit a nearby mature forest stand that lies on similar slope and aspect. However, such stands are not always readily available. In this guide, to the extent possible, keys and other information are given to help estimate the parent plant association for early seral communities.

Early seral communities may follow, or be followed by, other early seral communities. A short discussion is included for each community regarding these "successional pathways". Due to the dynamic nature of early seral vegetation, it was often difficult to draw more than inferences. Interpretations of pathways are from data collected from many sites over a short period of time, and do not include observations of sites through time. However, some indications can be seen. Some, such as the EPAN community, are very young, both in age since harvest, structurally (the tree layer is not as developed as many other early seral communities, see Table 2). The EPAN community also contains a strong component of colonizing species. These communities are obviously in a very "early" successional stage. Others, such as the CACH-PAMY community, are older, have more developed tree layers, and are dominated (in shrub and forb layers) by residual species, that have had time to re-establish following disturbance. Possible "pathways" exist when an older community contains similar plant composition to a younger community, usually with less dominance by colonizing species, has greater dominance of residual species, and exists on the same or similar plant associations.

Table 2
Early Seral Communities
Ages, Cover in trees > 12 feet tall

Community	AGE (Yrs)	Range	TM* Cover
BENE-FRAGA		No info	26
CEVE-XETE	18	5-28	14
EPAN	18	10-26	6
ACCI-PAMY	23	23	21
VAME-XETE	23	3-33	16
RUPA-EPAN	24	12-42	31
RHMA	25	9-34	19
OPHO-OXOR	26	20-38	40
XETE	27	12-35	16
CACH-XETE	28	5-33	23
CEVE-CACH	29	15-39	22
VAAL-ACCI-COCA	32	19-38	34
LIBO-XETE	32	30-34	28
CACH-PAMY	34	33-35	33
PTAQ-PEEU	35	28-39	21
VAAL-RHMA	35	16-38	22

* Cover of trees greater than 12 feet tall

Use of the Key

It is important to understand how the key was developed, and how it should be used. The Communities classified were developed from plot data, with plots being grouped according to similarity of vegetation. Few stands will exactly conform to the resulting "average" descriptions, since variation of vegetation is continuous across the landscape. In many instances, a location may be similar to more than one described community.

Steps in using the Key are:

1. Select a vegetatively uniform area that is at least 8 meters (26 feet) in radius. The plot should be representative of a larger area.
2. Identify and list tree, shrub, and herb species, and estimate the percent cover of each. Cover is estimated to the nearest percent up to 10 percent, and the nearest 5 percent thereafter.
3. Work through the community key, and cover/constancy tables, to obtain a preliminary identification.
4. Review the community description to verify.

Identifying "Parent" Plant Association:

For many communities, it is not possible to identify the parent plant association from early seral vegetation. For those communities, identification of plant association should come from a nearby mature forest, as possible:

1. Select a comparable mature forest site. Preferably, use a site adjacent to the early seral stand, at similar elevation and aspect.
2. If similar slope and aspect sites are not adjacent, choose the closest nearby stand with similar aspect and elevation.
3. If no similar sites are available, look for residual "islands" of pretreatment vegetation that may exist in small areas that are undisturbed, or only slightly disturbed.

Key to early seral communities, Pacific Silver Fir Zone
Mt. Hood National Forest

1. Snowbrush ceanothus (CEVE) ≥ 5%.....1A
   1A. Beargrass (XETE) ≥ 5%.....**Snowbrush/Beargrass CEVE/XETE Page 43**
   1A. XETE <5%.....1B
      1B. XETE present.....1C
      1B. XETE absent.....**Snowbrush-Chinquapin CEVE-CACH Page 40**
         1C. CACH + Snowberry (SYMPH) + Sticky Currant (RIVI) + (RISA) ≥ XETE.....**Snowbrush-Chinquapin CEVE-CACH Page 40**
         1C. XETE > CACH + SYMPH + RIVI + RISA.....**Snowbrush/Beargrass CEVE/XETE Page 43**

1. CEVE < 5%.....2

2. Alaska huckleberry (VAAL) + Ovalleaf huckleberry (VAOV) ≥ 5%.....2A
   2A. Devil's club (OPHO) ≥ 2% or Oregon oxalis (OXOR) ≥ 5%.....**Devil's club/Oregon oxalis OPHO/OXOR Page 54**
   2A. Not as above.....2B
      2B. Rhododendron (RHMA) ≥ 5%.....**Alaska huckleberry-Rhododendron VAAL-RHMA Page 72**
      2B. RHMA < 5%.....**Alaska huckleberry-Vine maple/Dogwood bunchberry VAAL-ACCI/COCA Page 69**

2. VAAL + VAOV < 5%.....3

3. RHMA ≥ 10%.....**Rhododendron RHMA Page 61**

3. RHMA < 10%.....4

4. CACH ≥ 5%.....4A
   4 A. XETE > Oregon Boxwood (PAMY), or Pinemat manzanita (ARNE) ≥ 5%.....**Chinquapin/Beargrass CACH/XETE Page 36**
   4 A. PAMY > XETE, ARNE < 5%.....4B
      4B. ACCI ≥ 5%.....5B
      4B. ACCI <5%.....**Chinquapin-Oregon boxwood CACH-PAMY Page 33**

4. CACH < 5%.....5

5. ACCI ≥ 5%.....5A

5A. ARNE ≥ 5% and XETE present.....**Chinquapin/Beargrass CACH/XETE Page 36**

5A. ARNE < 5%, or absent.....5B

5B. PAMY ≥ 2%.....**Vine Maple-Oregon boxwood ACCI-PAMY Page 26**

5B. PAMY < 2%.....5C

5C. OPHO ≥ 2% or OXOR ≥ 5%.....**Devils' Club/Oregon oxalis OPHO/OXOR Page 54**

5C. not as above.....5D

5D. COCA ≥ 5%, or if less, COCA > Fireweed (EPAN), and Thimbleberry (RUPA) < 5%.....**Alaska huckleberry-Vine maple/Dogwood bunchberry VAAL-ACCI/COCA Page 69**

5D. not as above.....5E

5E. RUPA or SYMPH ≥ 5%; or if stand is nearing stem exclusion (cover of trees > 12 feet tall over 50%) RUPA or SYMPH present but in smaller amounts.....**Thimbleberry/Fireweed RUPA/EPAN Page 65**

5E. not as above.....5F

5F. Cover in trees > 12 feet tall < 15%, and EPAN ≥ 10%.....**Fireweed EPAN, Page 47**

5F. not as above.....5G

5G. XETE dominates forb layer.....**Chinquapin/Beargrass CACH/XETE Page 36**

5G. not as above.....**Unclassified ACCI type**

5. ACCI < 5%.....6

6. Glaucous penstemon (PEEU) present.....**Bracken fern-Glaucous penstemon PTAQ-PEEU Page 57**

6. PEEU absent.....7

7. PTAQ ≥ 10%.....7A

7A. XETE > PTAQ.....**Fireweed EPAN Page 47**

7A. not as above.....7B

7B. PTAQ > RUPA.....**Bracken fern-Glaucous penstemon PTAQ-PEEU Page 57**

7B. RUPA ≥ PTAQ.....**Thimbleberry/Fireweed RUPA/EPAN Page 65**

7. PTAQ < 10%.....8

8. RUPA present.....8A

8A. RUPA or SYMPH ≥ 5%.....**Thimbleberry/Fireweed RUPA/EPAN Page 65**

8A. not as above.....9

9. Cover of trees > 12 feet tall < 15%, or if less, EPAN along with either ANMA or LULA clearly dominate forb layer.....**Fireweed EPAN Page 47**

9. not as above.....10

10. XETE ≥ 5%.....10A

10A. Twinflower (LIBO2) ≥ 5%.....**Twinflower-Beargrass LIBO2-XETE Page 51**

10A. LIBO2 < 5%.....10B

10B. EPAN + LULA + ANMA + PTAQ ≥ 2%, or at least 2 of these forbs present.....**Beargrass XETE Page 80**

10B. Invading forbs mostly absent, XETE and Big. huckleberry (VAME) usually dominate.....**Big huckleberry/ Beargrass VAME/XETE Page 76**

10. XETE < 5%.....11

11. Woods strawberry (FRVE) + Broadpetal strawberry (FRVI) ≥ 5% and Dwarf Oregongrape (BENE) present.....**Dwarf Oregongrape/ Strawberry BENE/FRAGA Page 29**

11. not as above.....12

12. Cover of trees very dense, understory vegetation sparse.....**STEM EXCLUSION STAGE**

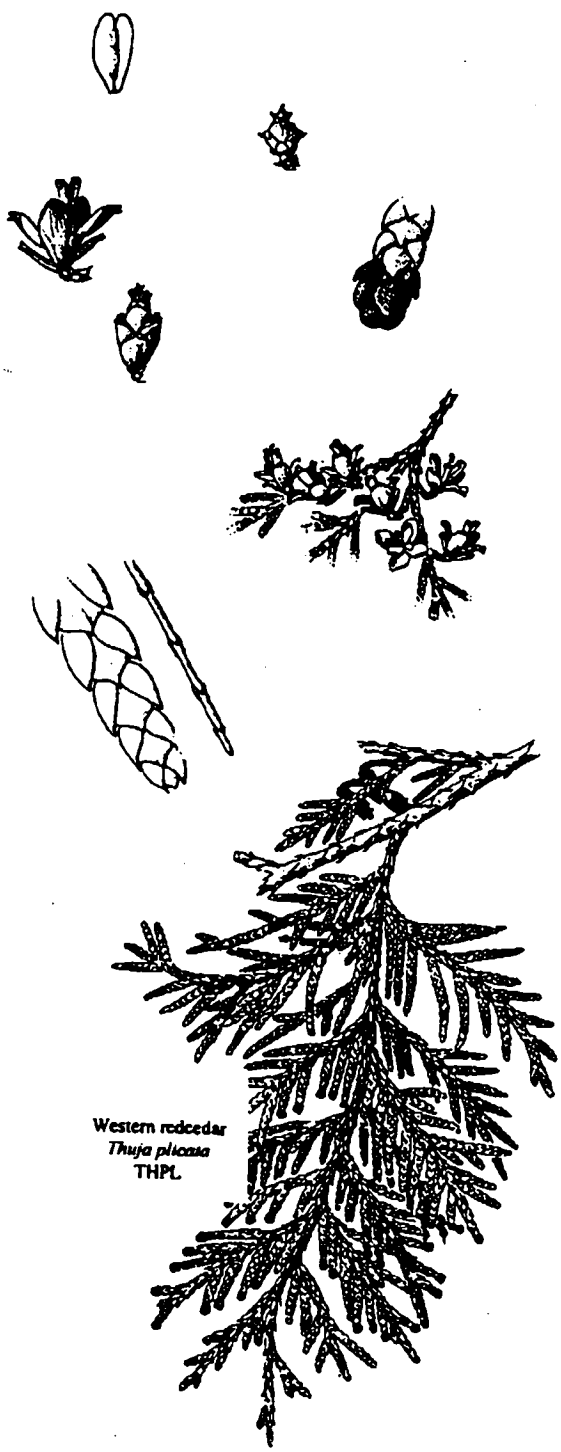
12. Not as above, could be wrong major plant zone, unclassified type, or go back through the key, using lower cover breaks and see if a reasonable fit exists.

LIST OF ABBREVIATIONS, SCIENTIFIC AND COMMON NAMES OF TREES, SHRUBS, AND HERBS USED IN KEY AND COMMUNITY DESCRIPTIONS

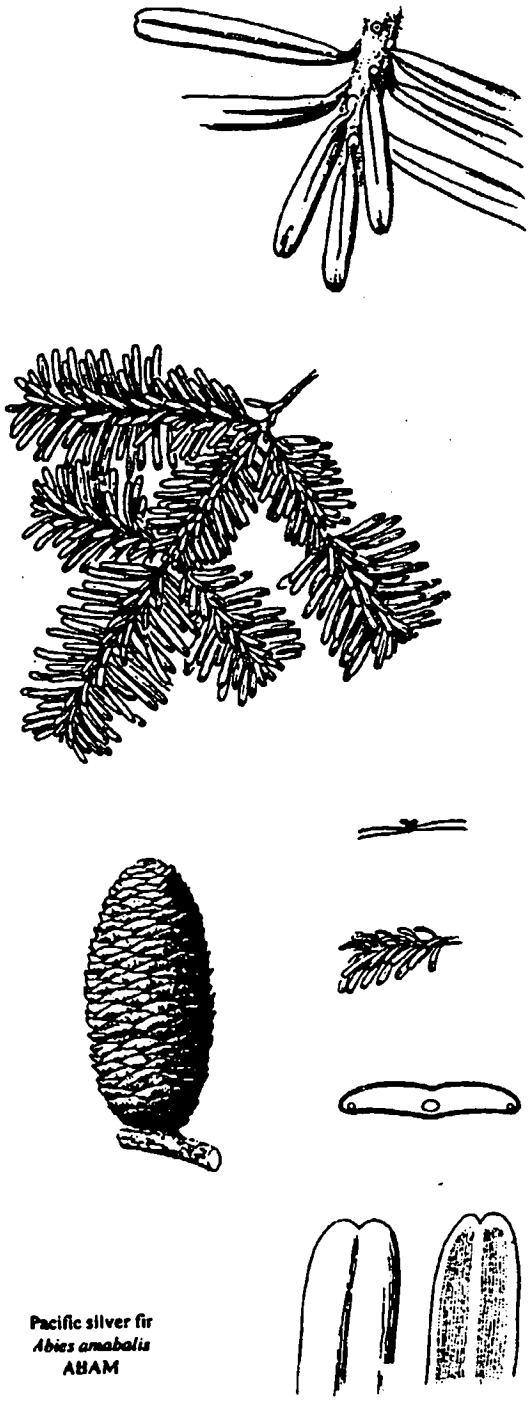
ACRONYM	SCIENTIFIC NAME	COMMON NAME	INDICATION[1]
Trees:			
ABAM	Abies amabalis	Pacific silver fir	cool
ABGR	Abies grandis	Grand fir	
ABPR	Abies procera	Noble fir	
ALSI	Alnus sinuata	Sitka alder	
CHNO	Chamaecyparis nootkatensis	Alaska cedar	cold, wet
PICO	Pinus contorta	Lodgepole pine	
PIEC	Picea engelmannii	Engelmann spruce	cold
PIMO	Pinus monticola	Western white pine	
PIPO	Pinus ponderosa	Ponderosa pine	hot, dry
POTR	Populus trichocarpa	Black cottonwood	
PREM	Prunus emarginata	Bitter cherry	
PSME	Pseudotsuga menziesii	Douglas-fir	
THPL	Thuja plicata	Western redcedar	
TSHE	Tsuga heterophylla	Western hemlock	warm
TSME	Tsuga mertensiana	Mountain hemlock	cold, deep snow
Shrubs:			
ACCI	Acer circinatum	Vine maple	
AMAL	Amelanchier alnifolia	Western serviceberry	
ARNE	Arctostaphylos nevadensis	Pinemat manazanita	Dry; Invading species
BENE	Berberis nervosa	Dwarf orgegongrape	warm
CACH	Castanopsis chrysophylla	Chinquapin	warm
CEVE	Ceanothus velutinus	Snowbrush	Disturbance; Invading species
CHUM	Chimaphila umbellata	Prince's pine	
CONU	Cornus nuttallii	Pacific dogwood	Warm
GAOR	Galium oreganum	Oregon bedstraw	
GAOV	Gaultheria ovatifolia	Wintergreen	
GASH	Gaultheria shallon	Salal	Warm, dry
OPHO	Oplopanax horridum	Devil's club	Wet
PAMY	Pachistima myrsinites	Oregon boxwood	Warm
RHMA	Rhododendron macrophyllum	Rhododendron	
RILA	Ribes lacustre	Prickly currant	
RIVI	Ribes viscosissimum	Sticky currant	
ROGY	Rosa gymnocarpa	Baldhip rose	Warm, dry
RULA	Rubus lasiococcus	Dwarf bramble	Cool
RUPA	Rubus parviflorus	Thimbleberry	Invading species
RUSP	Rubus spectabilis	Salmonberry	Warm, wet
RUUR	Rubus ursinus	Trailing blackberry	Warm
SYMO	Symphoricarpos mollis	Snowberry (trailing)	Warm, dry
SYMPH	Symphoricarpos spp.	Snowberry	
VAAL	Vaccinium alaskaense	Alaska huckleberry	Cool
VAME	Vaccinium membranaceum	Big huckleberry	Cool-cold
VAOV	Vaccinium ovalifolium	Oval-leaf huckleberry	Cool
VAPA	Vaccinium parvifolium	Red huckleberry	Warm
Herbs:			
ACTR	Achlys triphylla	Vanillaleaf	Moist
ANLY 2	Anemone lyallii	Nine-leaved anemone	Moist
ANMA	Anaphalis margaritacea	Pearly everlasting	Invading species
BLSP	Blechnum spicant	Deerfern	Moist

ACRONYM	SCIENTIFIC NAME	COMMON NAME	INDICATION[1]
CASC2	Campanula scouleri	Scouler's bluebell	
CLUN	Clintonia uniflora	Queencup beadlily	Cool, moist
COCA	Cornus canadensis	Dogwood bunchberry	Cool, moist
EPAN	Epilobium angustifolium	Fireweed	Invading species
FRVE	Fragaria vesca	Woods strawberry	Invading species
FRVI	Fragaria virginiana	Broadpetal strawberry	Invading species
GAOR	Galium oreganum	Oregon bedstraw	
HIAL	Hieracium albiflorum	White hawkweed	
LIBO2	Linnea borealis	Twinflower	Warm
LULA	Lupinus latifolius	Broadleaf lupine	Invading species
OXOR	Oxalis oregana	Oregon oxalis	Moist
PEEU	Penstemon euglaucus	Glaucous penstemon	Invading species
POMU	Polystichum munitum	Western swordfern	Warm, mesic
PTAQ	Pteridium aquilinum	Bracken fern	Disturbed sites; Invading species
SMST	Smilacina stellata	Starry solomonplume	Moist
TITRU	Tiarella trifoliata v. unifoliata	Coolwort foamflower	Moist
TRLA2	Trientalis latifolia	Western starflower	
TROV	Trillium ovatum	Pacific trillium	
VAHE	Vancouveria hexandra	Inside-out-flower	Moist, warm
XETE	Xerophyllum tenax	Beargrass	Cold, dry
Grasses/ Sedges:			
CACA 2	Carex californica		
CAGE	Carex geyeri		
CAPE 5	Carex pensylvanica		
CARE	Carex retrorsa		
FEOC	Festuca occidentalis		
GRAMINAE	Graminae		
LUPA	Luzula parviflora		
FERU	Festuca rubra		

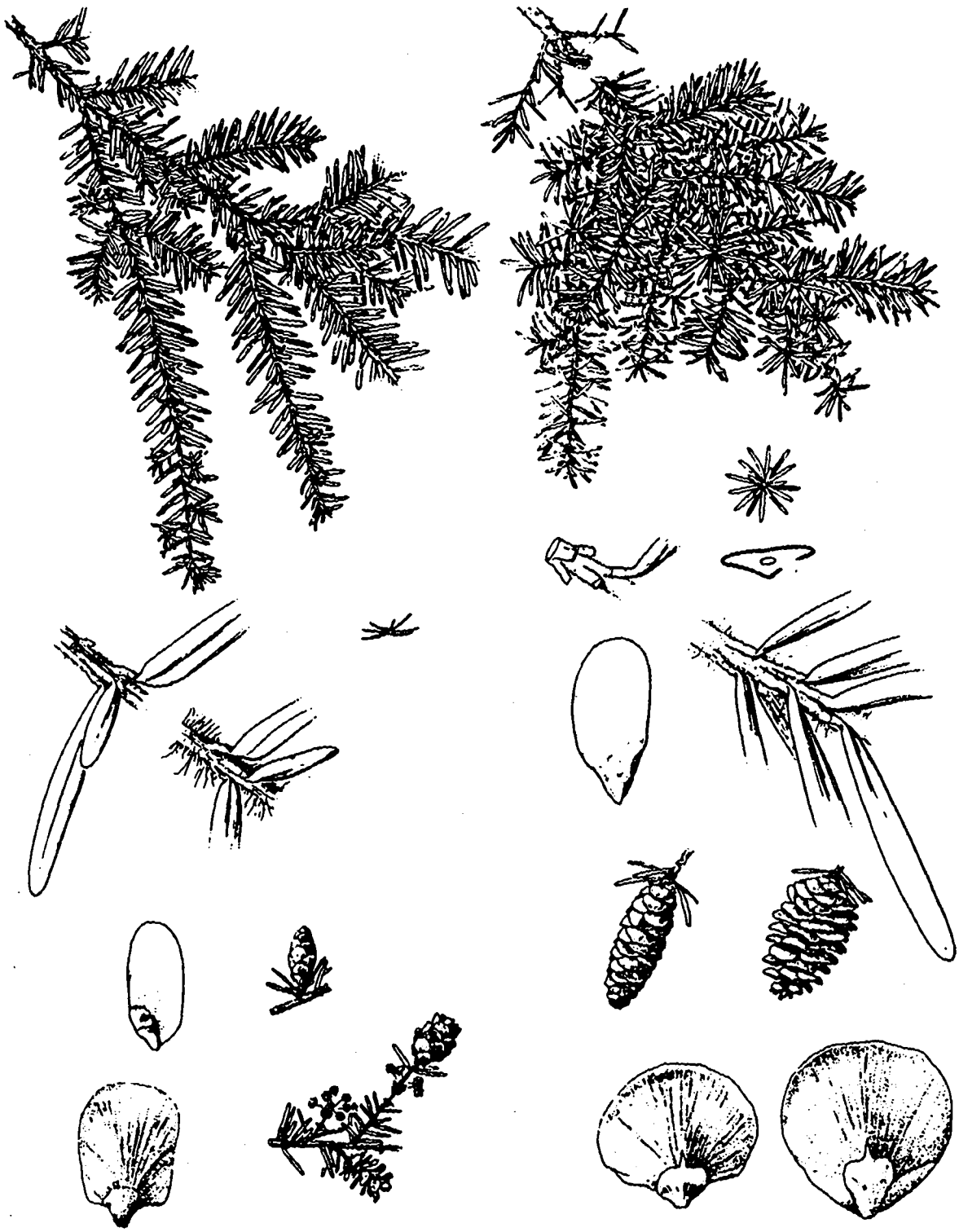
[1] Environmental indication is strong when several species indicating similar conditions are present, and their cover is high. Opposite indications should be weighedby number of indicators present, and their percent cover.
Trees should be used as indicators with caution; they may have been planted. Their presence may be the result of management choice, and not reflect site conditions.



Western redcedar
Thuja plicata
THPL

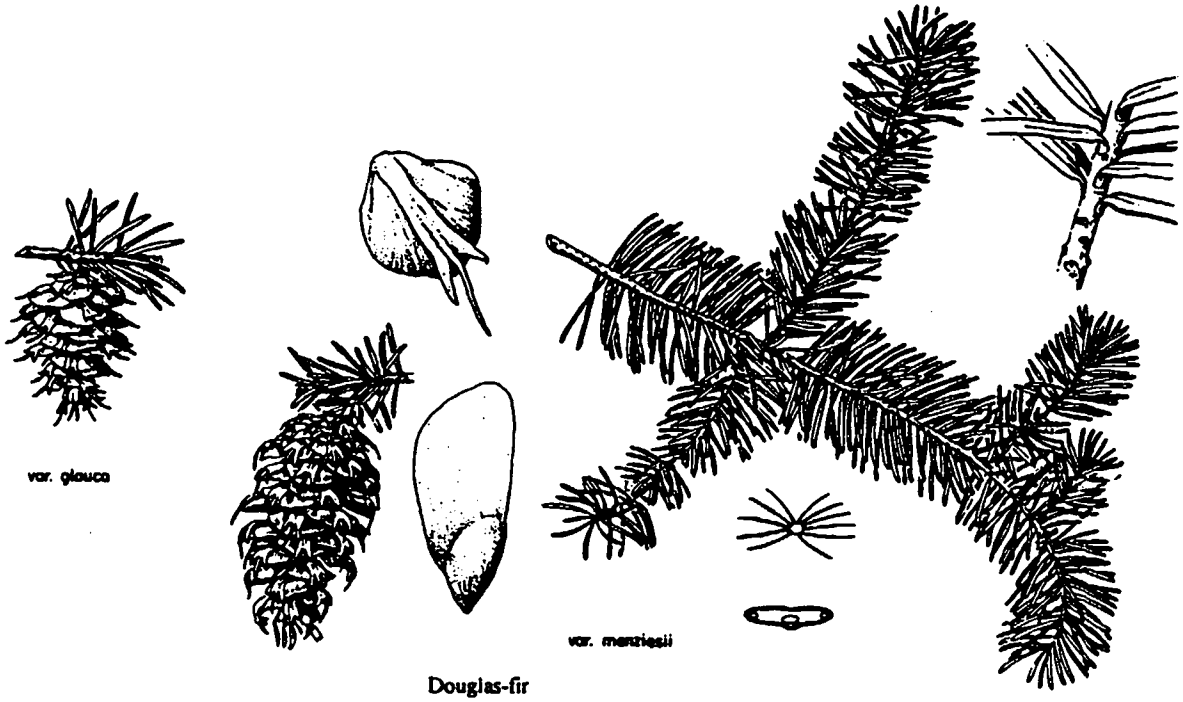


Pacific silver fir
Abies amabalis
ABAM

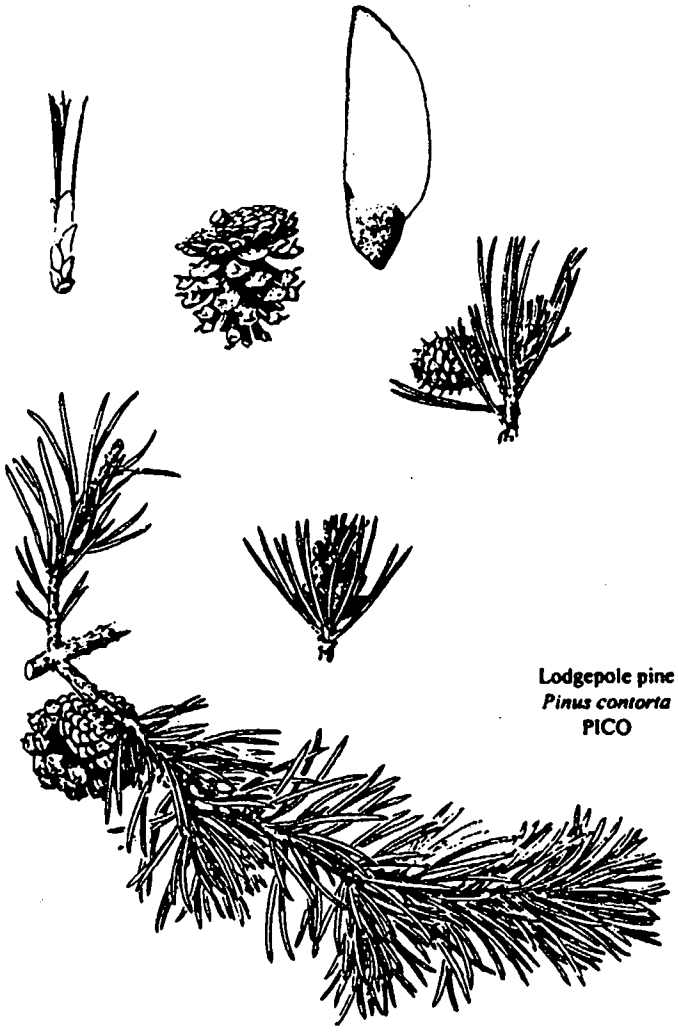


Western hemlock
Tsuga heterophylla
TSHE

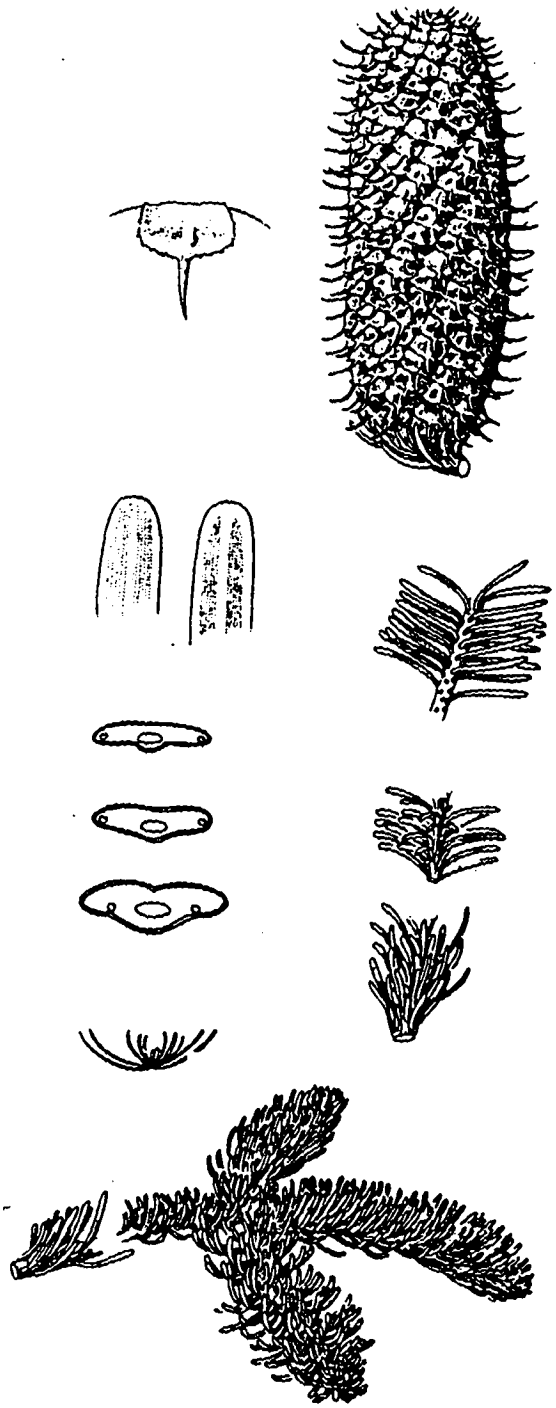
Mountain hemlock
Tsuga mertensiana
TSME



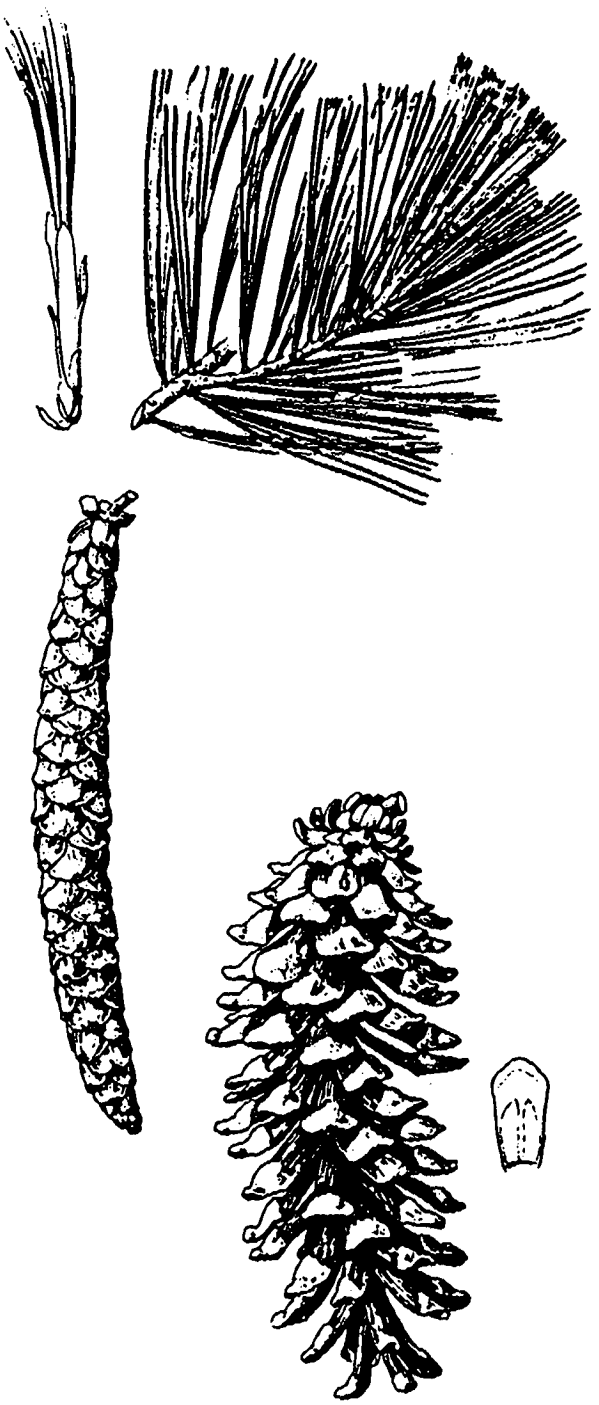
Douglas-fir
Pseudotsuga menziesii
PSME



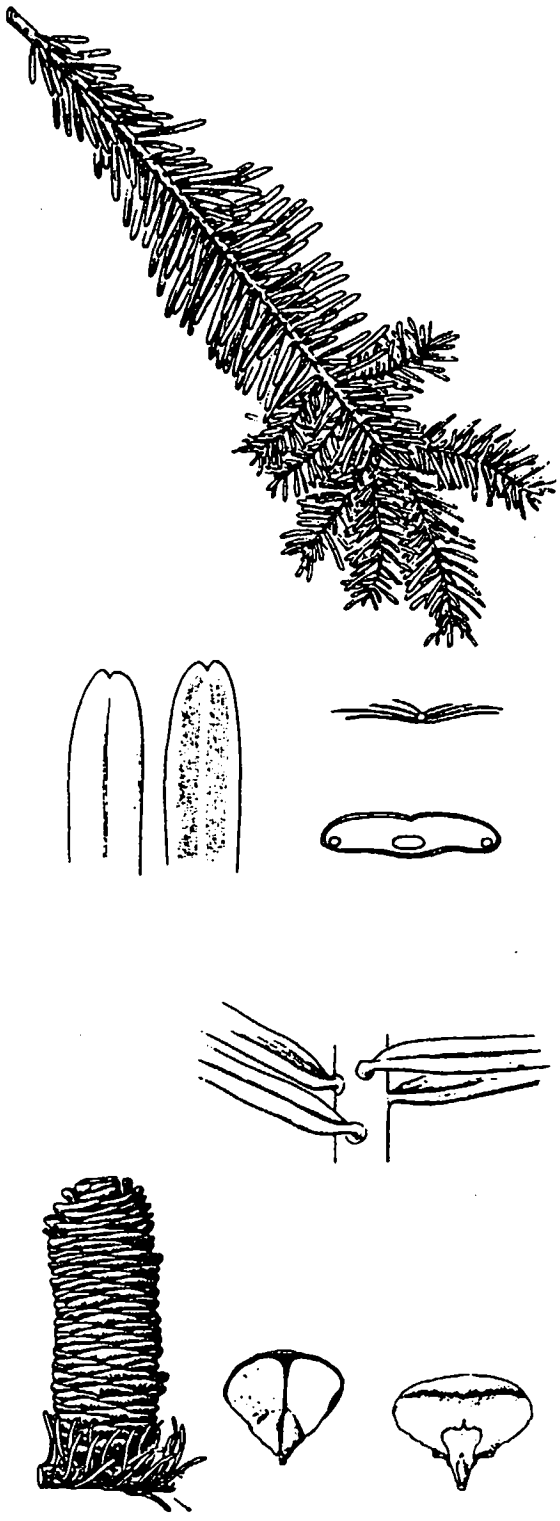
Lodgepole pine
Pinus contorta
PICO



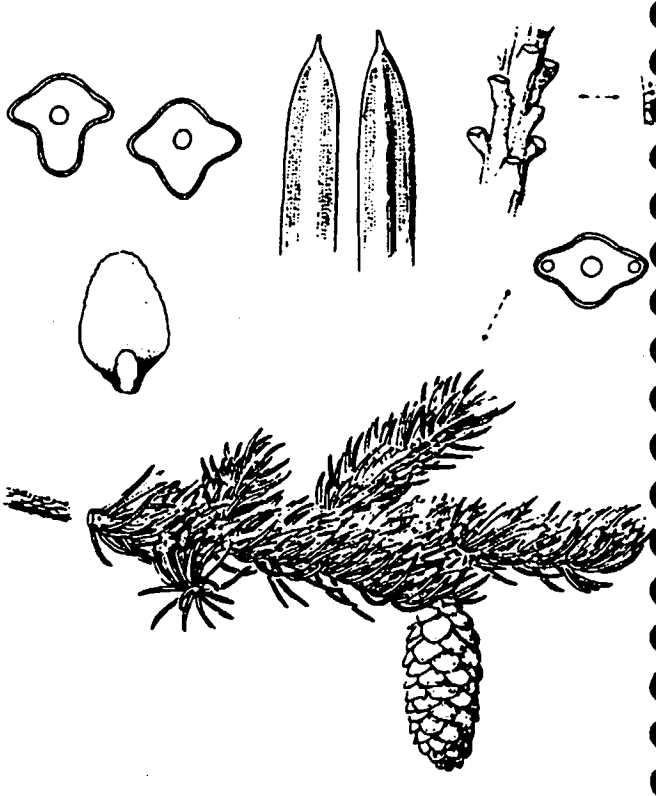
Noble fir
Abies procera
ABPR



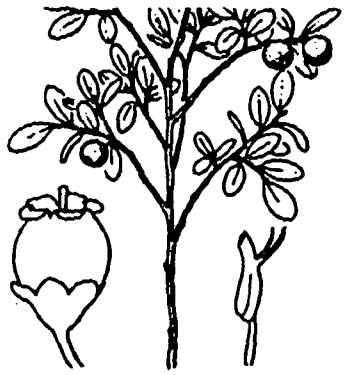
Western White Pine
Pinus monticola
PIMO



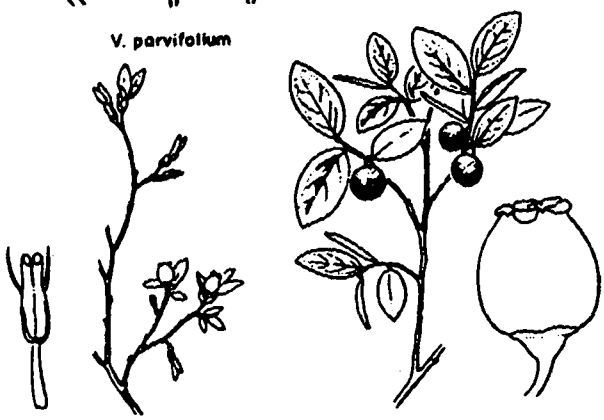
Grand fir
Abies grandis
ABGR



Engelmann spruce
Picea engelmanii
PIEN

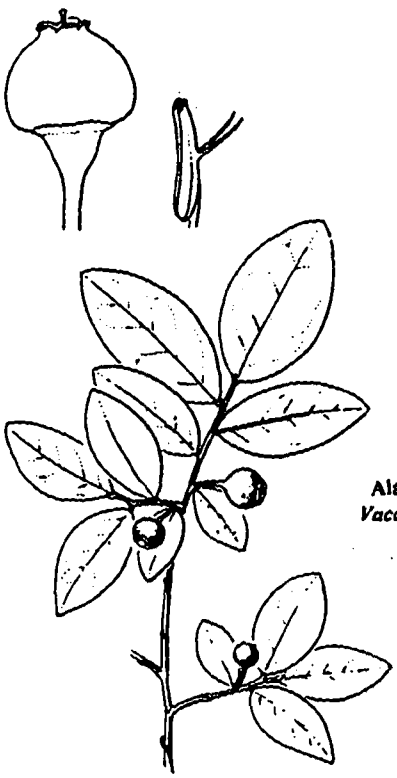


V. parvifolium



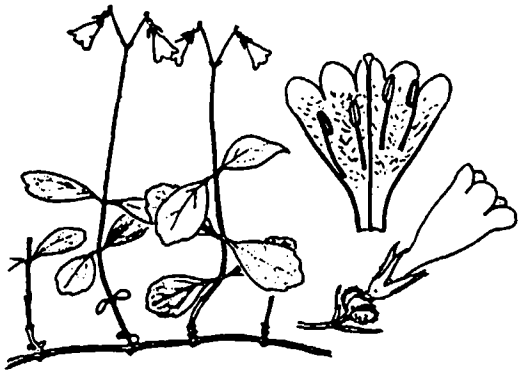
Ovalleaf huckleberry
Vaccinium ovalifolium
VAOV

Big Huckleberry
Vaccinium membranaceum
VAME



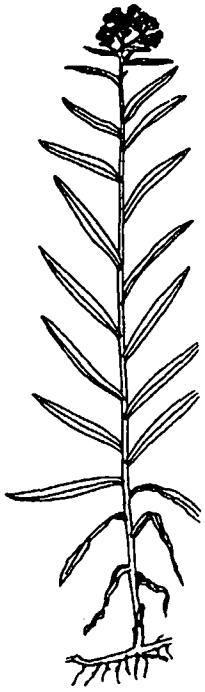
Alaska huckleberry
Vaccinium alaskaense
VAAL

Rhododendron
Rhododendron macrophyllum
RHMA



Twinflower
Linnea borealis
LIBO2

Glaucous penstemon
Penstemon euglaucus
PEEU



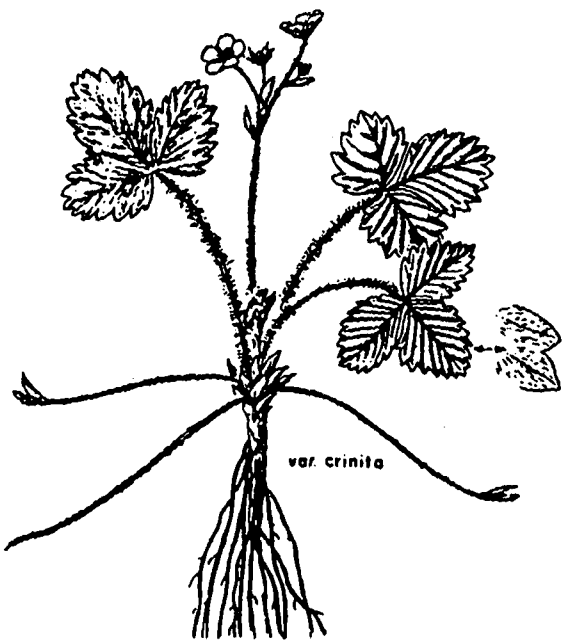
Pearly everlasting
Anaphalis margaritacea
ANMA

Broadleaf lupine
Lupinus latifolius
LULA

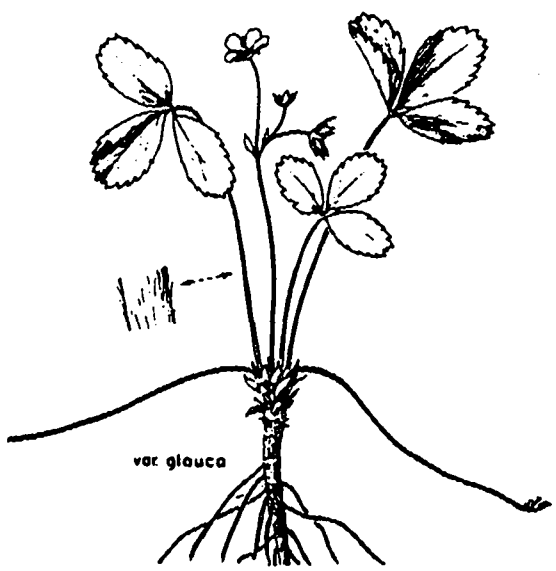
Fireweed
Epilobium angustifolium
EPAN

Oregon boxwood
Pachistima myrsinites
PAMY

Vine maple
Acer circinatum
ACCI

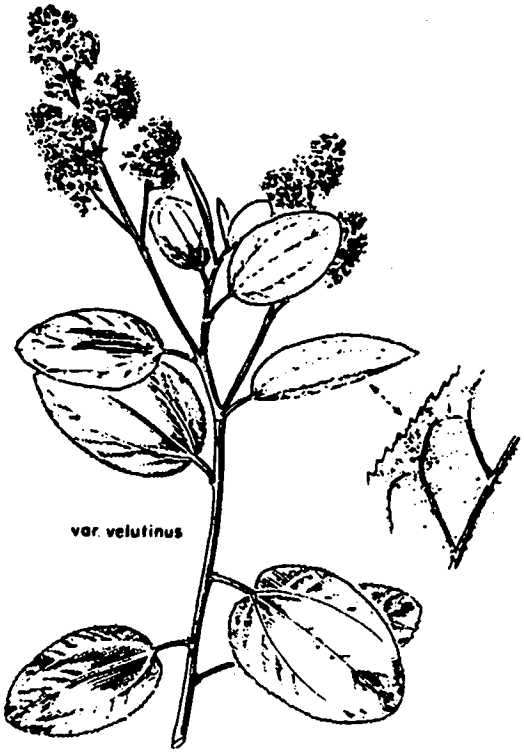


Woods strawberry
Fragaria vesca
FRVE

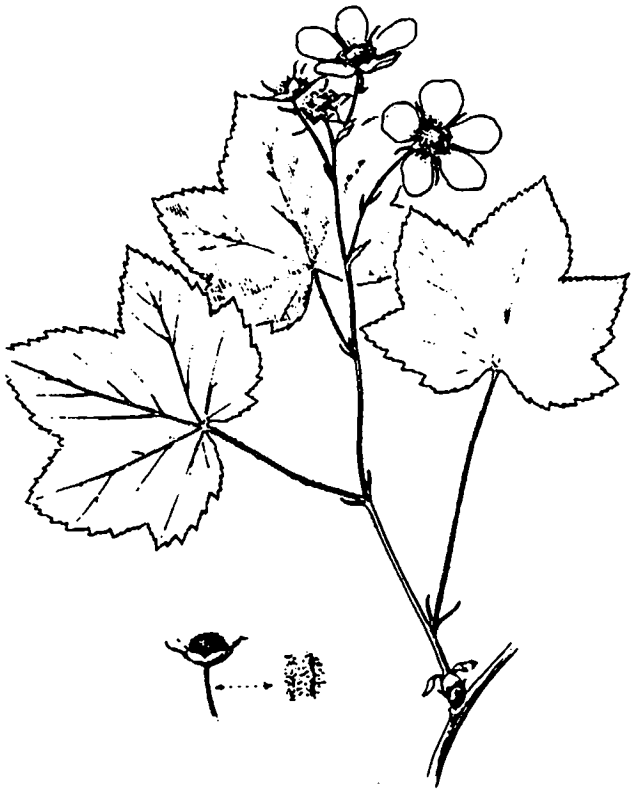


Broadpetal strawberry
Fragaria virginiata
FRVI

Chinquapin
Castanopsis chrysophylla
CACH

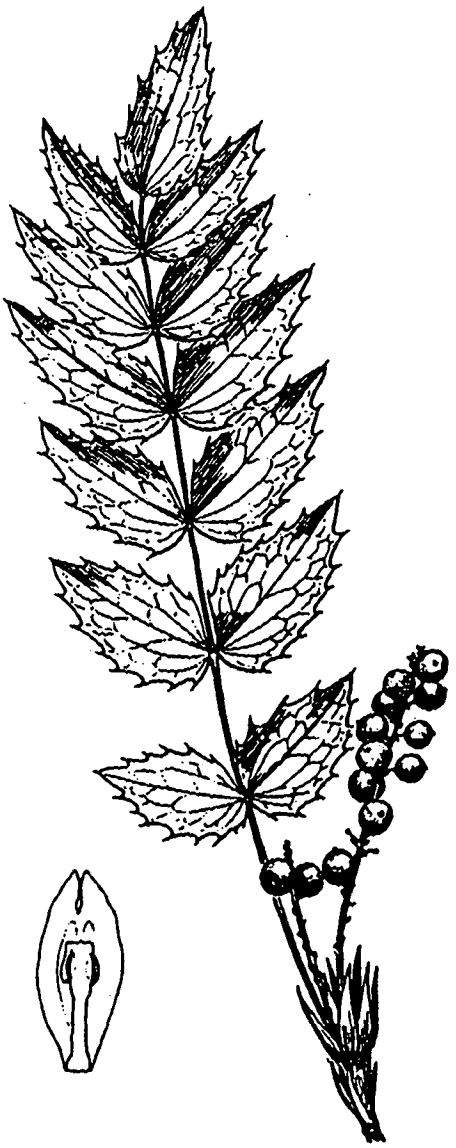


Snowbrush
Ceanothus velutinus
CEVE



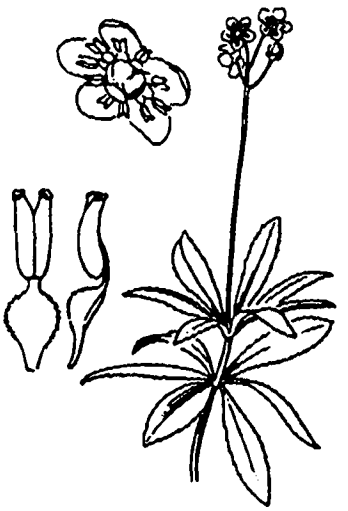
Thimbleberry
Rubus parviflorus
RUPA

Trailing blackberry
Rubus ursinus
RUUR

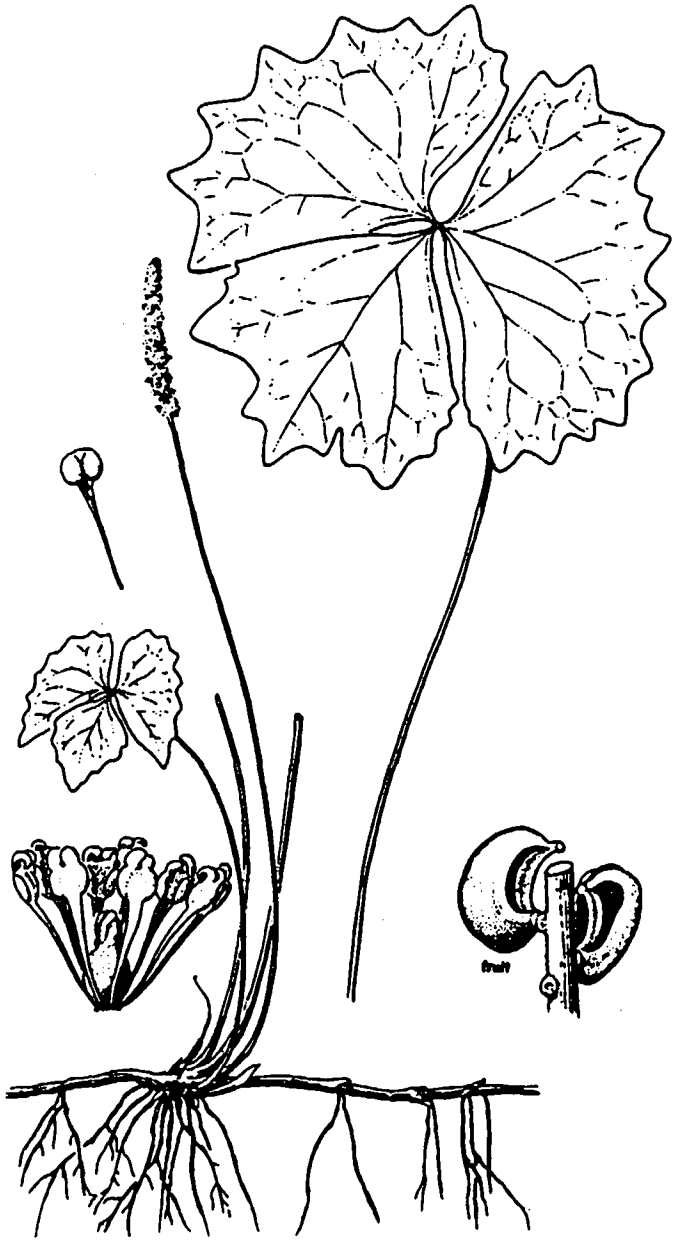


Dwarf Oregon grape
Berberis nervosa
BENE

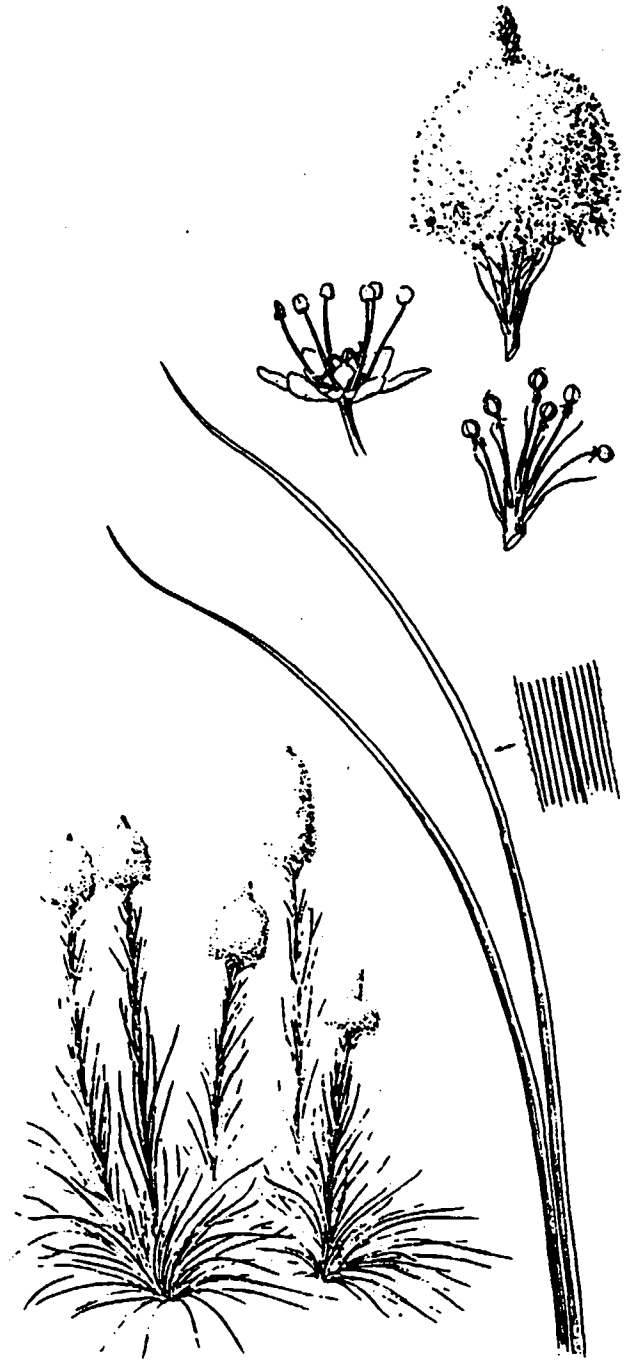
Pinemat manzanita
Arctostaphylos nevadensis
ARNE



Prince's pine
Chimaphila umbellata
CHUM

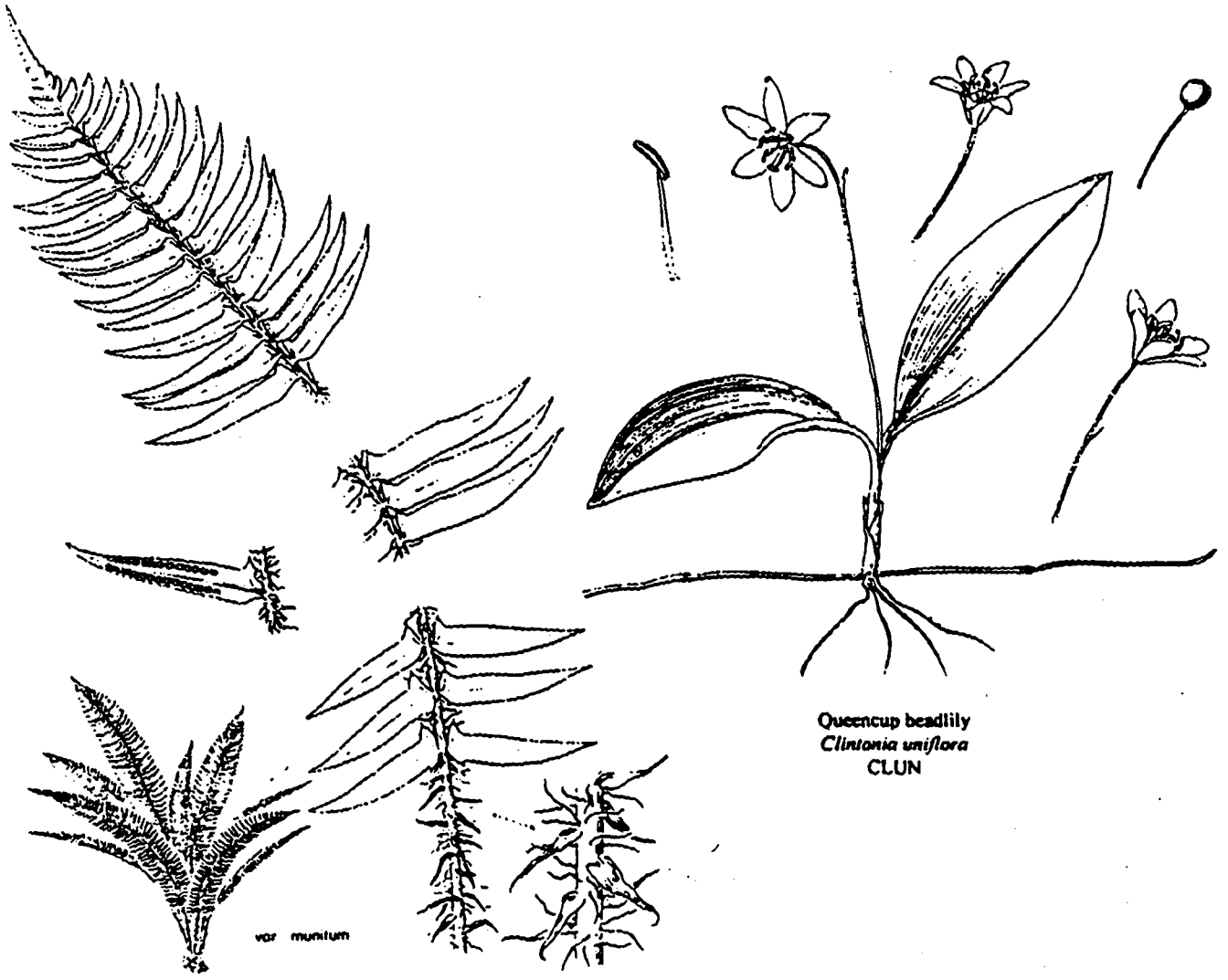


Vanillaleaf
Achlys triphylla
ACTR



Xerophyllum tenax

Bracken fern
Pteridium aquilinum
PTAQ



Queencup beadlily
Clintonia uniflora
CLUN

Western swordfern
Polystichum munitum
POMU

Vine Maple - Oregon Boxwood
Acer circinatum - Pachistima myrsinites
ACCI-PAMY

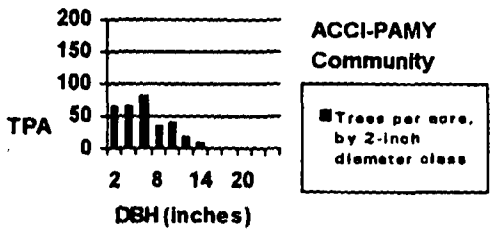
11 plots, located on 6 sites

Vegetation Structure and Composition:
Tree, shrub, and forb layers are well developed. Major components of the forb layer include starflower (TRLA2), beargrass(XETE), twinflower (LIBO2), and fireweed (EPAN). Pacific trillium (TROV) occured on the majority of sample plots. Vine maple (ACCI) and Oregon boxwood (PAMY) are the dominant shrubs, along with chinquapin (CACH), dwarf Oregongrape (BENE), trailing blackberry (RUUR), and thimbleberry (RUPA).

Species	Code	% Constancy	% Cover
Shrubs:			
Vine Maple	ACCI	100	17
Oregon Boxwood	PAMY	100	14
Chinquapin	CACH	82	7
Dwarf Oregongrape	BENE	82	3
Trailing blackberry	RUUR	73	8
Thimbleberry*	RUPA	55	6
Forbs:			
Starflower	TRLA2	91	4
Beargrass	XETE	73	5
Twinflower	LIBO2	64	9
Fireweed*	EPAN	64	3
Pacific Trillium	TROV	55	1

* = Invading species

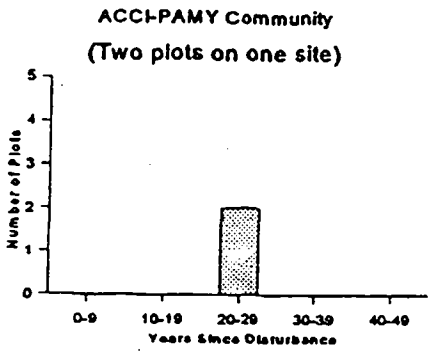
Douglas-fir (PSME), Pacific silver fir (ABAM), and western hemlock (TSHE) make up most of the tree layer. Numerous other species are present, including Mountain hemlock (TSME), noble fir (ABPR), and western white pine (PIMO). Most stocking on our plots was in trees that are 6 inches in diameter or less, although a few as large as 18 inches were found.



Environment and Distribution:
The Vine maple-Oregon boxwood community mostly lies on the drier portions of the Pacific Silver Fir Zone. More productive plant associations were not represented in the plots. The Vine maple-Oregon boxwood sample sites were spread across the Forest, in the Middle and West Fork Hood River, Oak Grove Fork Clackamas, Salmon River, and the White River watersheds. The average elevation of 3770 feet was mid-range for Pacific Silver Fir Zone early seral communities.

	Average	Range
Elevation (ft.):	3770	3400-4100
Common Aspects:	Westerly most common	
Slope (%):	35	20-55
Topographic Positions:		mid and upper slopes

Management Information: (Two plots on one site)
Timber harvest occurred over 20 years ago. Fuel treatment for both plots was pile and burn. Burn intensities were light to moderate.



Management Considerations:
The presence of minor tree species presents an opportunity to diversify species makeup in activities such as precommercial thinning. High elevation, flat sites are probably in the Pacific silver fir/Big Huckleberry/Beargrass (ABAM/VAME/XETE) plant association; these sites are prone to growing season frost (Halverson and Emmingham, 1982).
Vine maple and Oregon boxwood may present special forest products in this community, depending on markets. Most sites do not have large amounts of huckleberry, due to the dominance of other residual tall shrubs such as vine maple or rhododendron (RHMA).

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderate. Wildlife trails were observed on a few plots. Vine maple and Oregon boxwood provide high quality forage for ungulates and various other wildlife species. Chinquapin, dwarf Oregongrape, and trailing blackberry provide low to moderate quality browse. The forb layer provides small amounts of forage. Beargrass, fireweed, and twinflower are readily grazed by herbivores. Vine maple and small trees provide summer hiding cover for deer and elk.

These sites are primarily in the open sapling-pole stand condition. The mix of low and tall shrubs and young trees create diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. On some sites, rocks provide cover for small mammals and reptiles. Vine maple, dwarf Oregongrape, trailing blackberry, and thimbleberry provide fruit that attracts many species of wildlife including, songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed and trillium provide seeds for small mammals. Fireweed and Oregongrape provide nectar for hummingbirds.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Snags were absent on most plots. Those snags that were present were generally at low densities and less than 8 inches dbh. Down wood occurred at low levels and logs were usually less than 6 inches diameter. Some remnant logs were greater than 15 inches, but logs greater than 20 inches were rare. Wildlife dependent on snags and logs would be rare on these sites as existing woody debris occurs at low densities and is too small. Current harvest practices leave more large woody debris, thus, the ACCI-PAMY sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community over time.

Similar Early Seral Communities:

The Chinquapin-Oregon boxwood (CACH-PAMY) community contains no vine maple, and has only traces of fireweed, thimbleberry, and pearly everlasting, plants fairly common (occurring on about 1/2 plots) in the Vine maple-Oregon boxwood community. The Snowbrush-Chinquapin (CEVE-CACH) and Snowbrush/Beargrass (CEVE/XETE) communities contain large amounts of Oregon boxwood, but also have much higher occurrences of snowbrush, both in cover and constancy. The Snowbrush/Beargrass, Snowbrush-Chinquapin and Chinquapin-Oregon boxwood communities also have a wider variety of tree species, including ponderosa pine and grand fir.

Plant Association Predictability:
Plant association predictability is low; the eleven plots come from only six different harvest areas. The three plots in Pacific silver fir/Big huckleberry/Beargrass and the three from Pacific silver fir/Rhododendron/Beargrass (ABAM/RHMA/XETE) plant associations each come from single harvest units. Rhododendron occurred on all Pacific silver fir/Rhododendron/Dwarf Oregongrape (ABAM/RHMA/BENE) plots, and on no others, so is probably indicative of that association.

Common Shrubs and Forbs
(%cover/constancy)

# Plots	Plant Association	ACCI	PAMY	CACH	BENE	TRLA2	XETE
3	ABAM/RHMA/XETE	8/100	15/100	7/33	9/100	10/67	10/67
3	ABAM/RHMA/BENE	11/100	14/100	10/100	1/100	2/100	2/67
3	ABAM/VAME/XETE	23/100	9/100	10/100	+/67	2/67	1/100
2	ABAM/BENE	30/100	18/100	4/100	5/50	2/100	3/50

* = Trace amount

Early Seral Pathways:
The common presence on the Vine maple-Oregon boxwood community of invading species such as thimbleberry, fireweed, plus the relatively small cover in trees > 12 feet tall, indicate that this is one of the earlier seral communities. The extensive cover in vine maple and Oregon boxwood probably takes several years to develop; this community may thus follow the Fireweed community, or occasionally the Snowbrush-Chinquapin or Thimbleberry/Fireweed communities. The Vine maple-Chinquapin community probably is not followed by other early seral communities; vine maple and Oregon boxwood maintain themselves in partial shade, and the community most likely persists until the stem exclusion stage.

Dwarf Oregongrape/Strawberry
Berberis nervosa/Fragaria spp.
BENE/FRAGA

7 plots, located on 3 sites

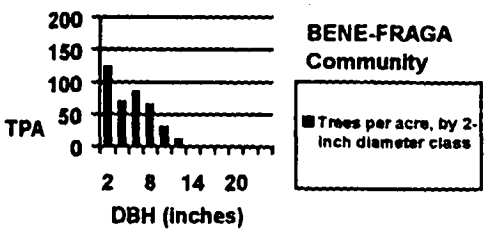
Vegetation: Structure and Composition:
Trees, shrubs, and forbs are well represented on all plots. Two forbs, Fireweed (EPAN) and white hawkweed (HIAL), are always present. Grasses or sedges are always present, often in heavy amounts. Woods strawberry (FRVE) or broadpetal strawberry (FRVI) are always present, and together have the highest amount of cover in the forb layer. Three shrubs, dwarf Oregongrape (BENE), Baldhip rose (ROGY), and trailing blackberry (RUUR) are also present on every plot, with big huckleberry (VAME), Oregon boxwood (PAMY), and western serviceberry (AMAL) occurring in small amounts on most plots.

Species	Code	% Constancy	% Cover
Shrubs:			
Dwarf Oregongrape	BENE	100	7
Baldhip rose	ROGY	100	4
Trailing blackberry	RUUR	100	3
Big huckleberry	VAME	71	+
Oregon boxwood	PAMY	57	1
Western serviceberry	AMAL	57	+
Forbs:			
Fireweed*	EPAN	100	2
White Hawkweed	HIAL	100	1
Woods strawberry*	FRVE	86	18
Pearly everlasting*	ANMA	86	2
Beargrass	XETE	86	1
Dogwood bunchberry	COCA	71	7
Tansy ragwort*	SEJA	71	+ OR 1
Grass/Sedge:			
California sedge	CACA2	71	5

*= Invading species
+ = Trace present

Douglas-fir is the most common tree, occurring on all plots. Lodgepole pine (PICO), western white pine (PIMO), and Engelmann spruce (PIEN) were the next most common trees over 12 feet tall.

Most stocking in the Dwarf Oregongrape/Strawberry community is in 8-inch or smaller trees, with a few trees as large as 12 inches dbh.



Environment and Distribution:
The Dwarf Oregongrape/Strawberry community occurs in relatively warm, dry plant associations, with moderate to low productivity for the Pacific Silver Fir Zone. The community occurs at the second lowest average elevation of Pacific Silver Fir Zone early seral communities. Plots are located in the Oak Grove Fork of the Clackamas River, and the Salmon River watersheds.

Elevation (ft.):	3085 (2800-3200)
Common Aspects:	Southeast or Southwest
Slope (%):	12 (3-20)
Topographic Position:	Mid and lower slopes, benches

Management Information: No management information was available for the 7 plots. Ecology and Managed Stand Survey plot information indicates that the cover of trees > 12 feet tall and stand tree diameters are similar to communities that are in their early 30's.

Management Considerations:

The Dwarf Oregongrape/Strawberry community occurs in two plant associations (Pacific silver fir/Dwarf Oregongrape and Pacific silver fir/Rhododendron/Dwarf Oregongrape). Although frost is not a major problem in these warmer Pacific Silver Fir Zone associations, the strong presence of western white pine (PIMO) and lodgepole pine in the tree layer may indicate some frost susceptibility in these sites. Sites are probably not severely frost prone.

This community appears to have few opportunities for harvest of special forest products. Sites contain only small amounts of huckleberry, beargrass, or other potential special forest products. Pruning of western white pine, to decrease potential for white pine blister rust mortality, should be considered in stands with a strong component of this tree species. Depending on markets and the amount of material, western white pine boughs may be commercially viable.

Wildlife Habitat Relationships:

Observed wildlife use (i.e., evidence of browse) of these sites was the lowest in any of the Pacific Silver Fir Zone early seral communities. Wildlife trails were not observed on any plots. Big huckleberry and Oregon boxwood provide quality browse but occur in very small amounts. Dwarf Oregongrape, baldhip rose, and trailing blackberry occur on every plot in small amounts, but provide only low to moderate quality browse. The forb layer provides small amounts of forage. Fireweed, white hawkweed, beargrass, fescue, and bunchberry dogwood are readily grazed. Density of tall shrubs and trees is usually not high enough to provide hiding or thermal cover for ungulates and other large mammals.

These sites are primarily in the open sapling-pole stand condition. The shrub layer is relatively sparse and consists mostly of low shrubs. Ground nesting birds and small mammals use cover of low shrubs. Tall shrubs are uncommon, thus songbirds that nest and forage in tall shrubs would be rare. Dwarf Oregongrape, baldhip rose, trailing blackberry, big huckleberry, strawberry and bunchberry dogwood produce fruit used by a variety of wildlife, but the cover of these shrubs and forbs is fairly low. Fireweed provides seeds for small mammals and nectar for hummingbirds. Lodgepole pine, western white pine, and ponderosa pine provide high quality seeds for many species of birds and mammals. These species occur on some sites and will provide seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Snags were absent on most plots. Those

snags that were present were generally at low densities and less than 10 inches dbh. Logs less than 12 inches in diameter were relatively common. Remnant logs greater than 15 inches were relatively common at low densities and logs greater than 20 inches occurred on some plots. Wildlife dependent on snags would be rare on these sites as existing snags are too small. Species dependent on logs may not be abundant but should occur on many of these sites. Current harvest practices leave more large woody debris, thus, the BENE-FRAGA sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
Dwarf Oregongrape is common on several other communities, none of which contain large amounts of woods strawberry and California sedge (CACA2). The Chinquapin-Oregon boxwood (CACH-PAMY) community contains dwarf Oregongrape, woods strawberry and broadpetal strawberry; however fireweed and pearly everlasting are uncommon. Chinquapin is common in the Chinquapin-Oregon boxwood community, but is virtually absent on the Dwarf Oregongrape-Strawberry community. The absence of snowbrush (CEVE) differentiates the Dwarf Oregongrape-Strawberry community from the Snowbrush/Beargrass (CEVE/XETE) and Snowbrush-Chinquapin (CEVE-CACH) communities.

Plant Association Predictability:

Plots occur in two plant associations, Pacific silver fir/dwarf Oregongrape (ABAM/BENE) and Pacific silver fir/rhododendron-dwarf Oregongrape (ABAM/RHMA/BENE). Big huckleberry occurs in the Pacific silver fir/Dwarf Oregongrape plant association, but not in Pacific silver fir/Rhododendron/Dwarf Oregongrape. Salal (GASH) is absent in the Pacific silver fir/Dwarf Oregongrape assocation, but occurs in all plots of Pacific silver fir/Rhododendron/Dwarf Oregongrape.

Key to plant associations:

1. Big huckleberry present; salal usually absent.
   Grasses and grasslike plants primarily
   California sedge and possibly western
   fescue.....>ABAM/BENE
1. Salal present, Big huckleberry absent.
   Graminae present and may be heavy,
   Carex and Idaho fescue usually
   absent.....>ABAM/RHMA-BENE

		Common Shrubs and Forbs (%cover/%constancy							
# Plots	Plant Association	BENE	VAME	GASH	EPAN	FRVE	CACA2	FEOC	HIAL
5	ABAM/BENE	7/100	+/100	0/0	+/100	24/100	5/100	5/100	1/100
2	ABAM/RHMA/BENE	6/100	0/0	3/100	5/100	7/100	0/0	0/0	+/100

+ = Trace amount

Early Seral Pathways:
The strong presence of invading species (fireweed, pearly everlasting, and woods strawberry) indicates that the Dwarf Oregongrape/Strawberry community is in a pioneer successional stage. On the Pacific silver fir/Dwarf Oregongrape plant association, the Dwarf Oregongrape/Strawberry community is the only community other than Big Huckleberry/Beargrass that lacks both snowbrush and thimbleberry. This community appears to persist for long periods of time.

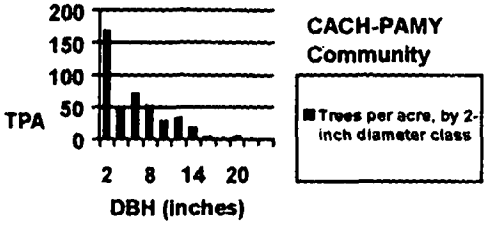
Chinquapin - Oregon Boxwood
Castanopsis chrysophylla - Pachistima myrsinites
CACH-PAMY

7 PLOTS
located on 3 sites

Vegetation: Structure and Composition:
This community is found in well-established stands; it is among the oldest of the Pacific Silver Fir Zone early seral communities, and has one of the highest coverages of trees greater than 12 feet tall. Bracken fern (PTAQ) and twinflower (LIBO2) occur on most plots, and have greatest average cover. Queencup beadlily (CLUN) and vanillaleaf (ACTR) also occur frequently, but in lesser amounts. Chinquapin (CACH) is the most common and dominant shrub; Oregon boxwood (PAMY) also occurs on all plots, but has much lower cover. Dwarf Oregongrape (BENE), baldhip rose (ROGY), big huckleberry (VAME), prince's pine (CHUM), and several other shrubs occur frequently. The CACH-PAMY community appears to be older and more developed than most other early seral communities.

Species	Code	% Constancy	% Cover
Shrubs:			
Chinquapin	CACH	100	22
Oregon Boxwood	PAMY	100	5
Dwarf Oregongrape	BENE	86	1
Baldhip Rose	ROGY	86	1
Big Huckleberry	VAME	71	2
Prince's Pine	CHUM	71	1
Forbs:			
Bracken Fern*	PTAQ	71	16
Twinflower	LIBO2	71	5
Queencup Beadlily	CLUN	71	3
Vanillaleaf	ACTR	71	1
(*= Invading species)			

Cover of trees > 12 feet is greater than all but the Alaska huckleberry-Vine maple/Dogwood bunchberry (VAAL-ACCI/COCA) early seral community. In addition, invading species, such as snowbrush (CEVE), thimbleberry (RUPA), and fireweed (EPAN) occur in smaller amounts than in similar communities. Shrub and forb species associated with developed forests appear to be more common.

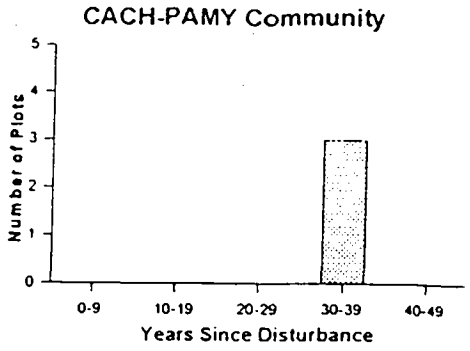


Tree species include noble fir (ABPR), Douglas-fir (PSME), ponderosa pine (PIPO), lodgepole pine (PICO), western larch (LAOC), western white pine (PIMO), western hemlock (TSHE), mountain hemlock (TSME), and grand fir (ABGR). PIPO and ABGR occur more frequently in this community than any other.

Environment and Distribution:
This community is located on the east side of the Forest; sample sites were located in the East Fork Hood River, and Rock-Threemile creek watersheds. Sites are generally mesic, but can be on the cold or warm end of the Pacific Silver Fir Zone spectrum. Site productivity is moderate to low. The average elevation of 3929 feet is among the higher Pacific Silver Fir Zone early seral communities.

Elevation (ft.):	3929 (3600-4300)
Common Aspects:	Mostly SW or NW
Slope (%):	10 (6-12)
Topographic Position:	Upper 1/3 of slopes, flats and benches

Management Information: (3 sites) Sampled stands were all about the same age, 33-35 years since regeneration harvest. Of the three sites, two were piled and burned, and one had no slash disposal information. Burn intensities were recorded as light to heavy.



Management Considerations:
Chinquapin-Oregon boxwood appears to be an older, well-established early seral community. Although this is one of the older communities, stands are still quite open; commercial thinning opportunities are still in the future. Precommercial thinning or commercial thinning operations present the opportunity to favor a wide range of tree species. Special forest products opportunities for Oregon boxwood (cuttings, transplants) and dwarf Oregongrape (medicinals) may be good in this community. Noble fir appears to have been widely planted on these sites; bough harvest may present an opportunity. Big huckleberry (VAME) may be abundant on some sites, although chinquapin usually dominates the high shrub layer.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderately high. Wildlife trails were observed on many plots. Oregon boxwood and big huckleberry provide high quality forage for ungulates and various other wildlife species. Chinquapin, dwarf Oregongrape, and baldhip rose also provide low to moderate quality browse. The forb layer provides little additional forage. The flat topography combined with thermal and hiding cover provided by shrubs and small trees should make these sites good foraging and resting habitat for ungulates and other large mammals.

These sites are primarily in the open sapling-pole to sawtimber stand conditions. The mix of low and tall shrubs and trees create diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. Big huckleberry, baldhip rose, and dwarf Oregongrape provide fruit that attracts many species of wildlife including, songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Ponderosa pine, lodgepole pine, and western white pine provide high quality seeds for many species of birds and mammals. These species occur on many sites and will provide seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Most plots had low densities of snags that were less than 8 inches dbh. Down wood occurred at low levels and logs were usually less than 15 inches diameter. Remnant logs greater than 20 inches were rare. Wildlife dependent on snags and logs would be rare on these sites as existing coarse woody debris is too small and sparse. Current harvest practices leave more large woody debris, thus, the CACH-PAMY sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:

The Vine maple-Oregon boxwood (ACCI-PAMY) community contains vine maple (ACCI), which is absent in the Chinquapin-Oregon boxwood community, and contains no grand fir or ponderosa pine. Average tree cover (trees > 12 feet tall) in the Vine maple-Oregon boxwood community is less (21%) than in Chinquapin-Oregon boxwood (33%), indicating younger, less successionally developed stands in the Vine maple-Oregon boxwood community. The Chinquapin/Beargrass community is similar to the Chinquapin-Oregon boxwood community in that it also contains grand fir and ponderosa pine; however, the Chinquapin/Beargrass community has a much greater amount of beargrass, as well as invading species such as fireweed and pinemat manzanita (ARNE). Bracken fern is much more common in the Chinquapin-Oregon boxwood community than in the Chinquapin/Beargrass community. The Snowbrush-Chinquapin community contains much higher amounts of snowbrush, fireweed, and pearly everlasting.

Plant Association Predictability:
Projection of plant association is only approximate; information was collected from only three sites, one in the Pacific silver fir/Dwarf Oregongrape plant association, and two in the Pacific silver fir/Big huckleberry/Queencup beadlily association. The presence of grand fir and ponderosa pine in this community indicate that it is transitional to the Grand fir zone.

A few inferences can be made. Bracken fern is much heavier on sites in the Pacific silver fir/Dwarf Oregongrape association (ave. 25% cover)than on sites in the Pacific silver fir/Big huckleberry/Queencup beadlily association (<1% cover). Wood's strawberry (FRVE), broadpetal strawberry, (FRVI), and white hawkweed(HIAL) all occur on every Pacific silver fir/Dwarf Oregongrape plot, but are not found on the plots in the Pacific silver fir/Big huckleberry/Queencup beadlily association.

		Common Shrubs and Forbs (%cover/%constancy)					
# Plots	Plant Association	CACH	PAMY	BENE	PTAQ	LIBO2	CLUN
4	ABAM/VAME/CLUN	26/100	8/100	1/100	1/50	7/100	3/100
2	ABAM/BENE	16/100	2/100	2/67	25/100	1/33	+/33
	+ = Trace amount						

Early Seral Pathways:
The Chinquapin-Oregon boxwood community is relatively old, and is probably followed by the stem exclusion stage on both the Pacific silver fir/Dwarf Oregongrape and Pacific silver fir/Big huckleberry/Queencup beadlily plant associations.

Chinquapin/Beargrass
Castanopsis chrysophylla/Xerophyllum tenax
CACH/XETE

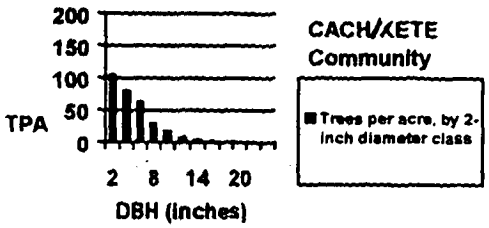
31 plots, located on 19 sites

Vegetation: Structure and Composition:
Both shrubs and trees are well established on these sites. Chinquapin (CACH) and big huckleberry (VAME) dominate the shrub layer; prince's pine (CHUM), wintergreen (GAOV), and dwarf Oregongrape (BENE) are also quite common. Beargrass (XETE) is the most common forb, occurring on all plots. Fireweed (EPAN) commonly occurs in smaller amounts. Twinflower (LIBO2) is the only other forb occurring on more than half of the sample plots.

Species	Code	% Constancy	% Cover
Shrubs:			
Chinquapin	CACH	100	13
Big Huckleberry	VAME	90	4
Prince's Pine	CHUM	77	3
Wintergreen	GAOV	65	5
Dwarf Oregongrape	BENE	65	2
Forbs:			
Beargrass	XETE	100	9
Fireweed*	EPAN	81	1
Twinflower	LIBO2	71	9
Pearly Everlasting*	ANMA	48	+

* = Invading Species
\+ = Trace amounts

The tree layer is well developed in the Chinquapin/Beargrass community. Sample plots show most trees to be under 10 inches in diameter, with a few as large as 16 or 18 inches. The most common species are Douglas-fir (PSME) and western white pine (PIMO), with a diverse array of other species making up smaller portions of the stands. A total of 13 tree species were sampled, with most sites containing at three.



Environment & Distribution:
The Chinquapin/Beargrass community occurs primarily in the cold/dry Pacific silver fir/Big huckleberry/Beargrass plant association (ABAM/VAME/XETE) and the warm/dry Pacific silver fir/Dwarf Oregongrape plant association (ABAM/BENE) within the Pacific Silver Fir Zone. It occurs infrequently in more moist, productive associations; one plot occurred in the Pacific silver fir/Coolwort foamflower (ABAM/TIUN) plant association. It appears to develop on relatively cold sites within the Pacific silver fir/Dwarf Oregongrape plant association, usually occupying gentle slopes. Site productivity is moderate to low on these plant associations. Sampling sites were spread across eight watersheds. The greatest number (eight sites) were located in the White River watershed. A total of four sites were located in the East, West, and Middle forks of the Hood river. Five sites were located in the Oak Grove Fork Clackamas, Upper Clackamas, and Salmon River watersheds.

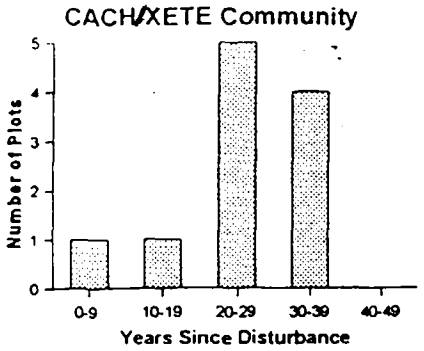
Elevation (ft.):	3840 (3400-4500)
Common Aspects:	Northerly aspects are more common (20 Plots) than southerly (20 plots)
Slope (%):	17 (2-32)
Topographic Position:	Mostly occurs on upper 1/3 of slopes, also on ridgetops, midslopes, benches

The average elevation of 3840 feet was in the mid-range for Pacific Silver Fir Zone early seral communities.

Management information: (11 Sites)

Age since regeneration harvest varies a great deal on this early seral community. Most sites were over 20 years of age; two were less than 20 years old.

Fuel treatments were predominantly broadcast burns, with no burning on two sites (from information available on nine sites) Burn intensities were light to moderate.



Management Considerations:
Thinning activities should emphasize retention of a diversity of tree species, something most sites can provide. Some stands may be good choices for boughs, where desirable species occur in good numbers.

The Chinquapin/Beargrass community contains the third highest constancy of big huckleberry of the early seral communities; it may be a good choice in which to emphasize huckleberry production. Prince's pine (CHUM) attained a higher cover and constancy in the Chinquapin/Beargrass community than on any other early seral community.

Wildlife habitat relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderately high but variable. Wildlife trails were observed on several plots. Except for big huckleberry and dwarf Oregongrape, browse for ungulates is low quality. Chinquapin and wintergreen produce low quality browse. The forb layer provides additional forage. Beargrass, fireweed, and twinflower are readily grazed by herbivores. Chinquapin and small trees provide some hiding cover for deer and elk.

These sites are primarily in the open sapling-pole stand condition. The mix of low and tall shrubs and young trees creates diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. On some sites, rocks provide cover for small mammals and reptiles. Big huckleberry and dwarf Oregongrape provide fruit that attracts many species of wildlife including, songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed provides seeds for small mammals. Fireweed and Oregongrape provide nectar for hummingbirds. Lodgepole pine and western white pine provide high quality seeds for many species of birds and mammals. These species occur on some sites and will provide seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Most plots had low densities of snags that were less than 10 inches dbh. Logs less than 12 inches in diameter were relatively common and dense. Remnant logs greater than 15 inches were relatively common at low densities. Wildlife dependent on snags would be

rare on these sites as existing snags are too small. Species dependent on logs would not be abundant but should occur on many of these sites. Current harvest practices leave more large woody debris; thus, the Chinquapin/Beargrass community sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
The Chinquapin-Oregon boxwood (CACH-PAMY) and Vine maple-Chinquapin (ACCI-PAMY) communities also contain large amounts of chinquapin. However, pinemat manzanita (ARNE), which occured in about half of the Chinquapin/Beargrass plots, was virtually absent in the Chinquapin-Oregon boxwood and Vine maple-Oregon boxwood communities. The Snowbrush/Beargrass (CEVE/XETE) and Big huckleberry/Beargrass (VAME/XETE) communities have less frequent occurrence of chinquapin and prince's pine. Chinquapin/Beargrass may be mid-range between the slightly colder Snowbrush/Beargrass and Big huckleberry/Beargrass communities, and the slightly warmer Chinquapin-Oregon boxwood and Vine maple-Oregon boxwood communities.

Plant Association Predictability:
The Chinquapin-Beargrass community is found in five plant associations, with Pacific silver fir/dwarf Oregongrape (ABAM/BENE) and Pacific silver fir/big huckleberry/beargrass (ABAM/VAME/XETE being most common (25 of 31 plots, 14 of 19 sites). The Chinquapin/Beargrass community occurs in the mid-environment for the Pacific Silver Fir Zone; warmer sites in this community mostly are in the Pacific silver fir/Dwarf Oregongrape plant association, with colder sites located in the Pacific silver fir/Big huckleberry/Beargrass plant association.

Clear indicators that point to particular endpoint plant associations are rare in the Chinquapin/Beargrass early seral plant community. Early seral stages of the Pacific silver fir/Dwarf Oregongrape and Pacific silver fir/Big huckleberry/Beargrass plant associations are difficult to separate on the basis of species composition. Coverage for major shrubs and forbs are similar (see table below).

		Common Shrubs and Forbs (%cover/%constancy)				
# Plots	Plant Association	VAME	CACH	XETE	EPAN	RHMA
14	ABAM/BENE	3/79	12/100	10/100	+/64	3/14
11	ABAM/VAME/XETE	4/100	14/91	11/100	+/100	5/27
3	ABAM/RHMA/XETE	8/100	7/100	14/100	4/100	3/67
2	ABAM/VAME/CLUN	15/100	15/100	4/100	+/50	0/0
1	ABAM/TIUN	+/100	17/100	5/100	+/100	0/0
	+ = Trace amount					

Early Seral Pathways:
The Chinquapin/Beargrass community is older, and has a more developed tree layer, than the Fireweed, Beargrass, Big Huckleberry/Beargrass, and Snowbrush/Beargrass communities. The well developed shrub layer, dominated by chinquapin, indicates that it usually (but not always) follows earlier communities,

and is followed by stem exclusion. Previous communities on these sites may be Fireweed, Beargrass, and possibly Snowbrush/Beargrass.

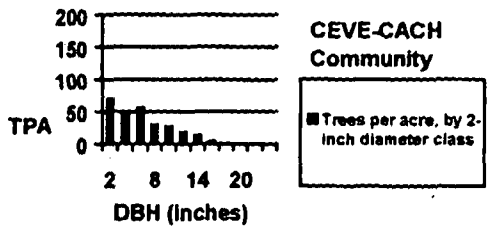
Snowbrush - Chinquapin
Ceanothus velutinus-Castanopsis chrysophylla
CEVE-CACH

26 plots, located on 12 sites

Vegetation: Structure and Composition:
Trees, shrubs, and forbs are well represented. Shrubs dominate most sites; snowbrush (CEVE), Oregon boxwood (PAMY), and chinquapin (CACH) occur on the majority of plots, and exceed 10% average cover. Vine maple (ACCI) and dwarf Oregongrape (BENE) also are found on the majority of plots, and trailing blackberry (RUUR) is almost always present in small amounts. The only forbs present on over half of the plots are starflower (TRLA2), bracken fern, (PTAQ) and fireweed (EPAN).

Species	Code	% Constancy	% Cover
Shrubs:			
Ceanothus *	CEVE	100	18
Pacific Blackberry	RUUR	92	5
Oregon Boxwood	PAMY	85	12
Golden Chinquapin	CACH	65	11
Vine Maple	ACCI	62	7
Dwarf Oregongrape	BENE	62	2
Forbs:			
Starflower	TRLA2	62	1
Bracken Fern *	PTAQ	54	9
Fireweed *	EPAN	50	1
Pearly Everlasting *	ANMA	42	1
(*= Invading species)			

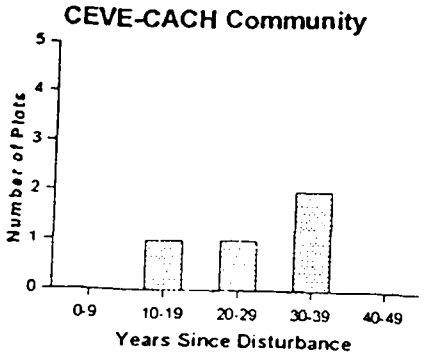
The tree layer is dominated by Douglas-fir (PSME) and noble fir (ABPR). Grand fir (ABGR), bitter cherry (PREM), western hemlock (TSHE) and several other species occur in smaller numbers. A few sites are dominated by other species, such as western white pine. Most sites contain at least three tree species. The large majority of trees are less than 10 inches dbh, with a few as large as 16 inches dbh.



Environment and Distribution:
Most plots in the Snowbrush-Chinquapin community are located in the Pacific silver fir/Dwarf Oregongrape (ABAM/BENE) plant association, with a few plots on five other associations. The community established following light to moderate intensity broadcast burns. Productivity is moderate to low for the Pacific Silver Fir Zone.

Elevation (ft.):	4023 (3500-4700)
Common Aspects:	Mostly SE or SW
Slope (%):	15 (1-23)
Topographic Position:	Ridgetops, mid and upper slopes, benches and flats

The Snowbrush-Chinquapin community is located on both sides of the Cascades; sampling sites are in the White River, Upper Clackamas, Rock-Threemile, and Oak Grove Fork Clackamas watersheds.



Management Information: (4 sites)
Ages since regeneration harvest varied from 15 to 39 years. All sites that had information regarding slash disposal were broadcast burned. Burn intensities were light to moderate.

Management Considerations:
Nitrogen input may be high in this community, due to the large amount of nitrogen-fixing snowbrush present. Most sites are not frost-prone. Stands are probably too small for commercial thinnings. Maintenance of open stands will lengthen the time in which nitrogen-fixing snowbrush dominates the shrub layer, helping site productivity. Huckleberries and other potential special forest products are not present in large amounts on these snowbrush- dominated sites. Oregon boxwood, which has use as cuttings and transplants, occurs on about two-thirds of sampled sites.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderate. Wildlife trails were observed on many plots. Ceanothus, Oregon boxwood, and vine maple provide high quality forage for ungulates and various other wildlife species. Blackberry, chinquapin, and Oregongrape provide low to moderate quality browse. The forb layer provides only small amounts of forage. Fireweed is readily grazed by herbivores, but occurs only at low densities. The moderate topography combined with thermal and hiding cover provided by shrubs and small trees should make these sites good foraging and resting habitat for ungulates and other large mammals.

These sites are primarily in the open sapling-pole stand condition. The mix of low and tall shrubs and young trees create diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. Ceanothus, vine maple, chinquapin, blackberry, Oregongrape, and fireweed all provide fruit or seeds that attract many species of wildlife including songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed, Oregongrape, and red-flowering currant (on some sites) provide nectar for hummingbirds. Ponderosa pine, Lodgepole pine, and western white pine provide high quality seeds for many species of birds and mammals. These species occur on some sites and will provide seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Snags were absent on many plots. Those snags that were present were generally at low densities and less than 8 inches dbh. Remnant snags greater than 20 inches were rare. Down logs less than 15 inches occurred at moderate densities. Remnant logs greater than 20 inches were rare. Wildlife dependent on snags would be rare on these sites as existing snags are too small. Species dependent on logs would not be abundant but should occur on many of these sites. Current harvest practices leave more large woody debris; thus, the Snowbrush-Chinquapin sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
The Snowbrush-Beargrass (CEVE/XETE) community also has large amounts of CEVE, but has much more XETE than Snowbrush-Chinquapin. The Chinquapin-Oregon boxwood community also contains large amounts of chinquapin, and has snowbrush occurring on about half of its sites, but at a much lower average cover (2% vs. 18%) than Snowbrush-Chinquapin. The Snowbrush-Chinquapin and Snowbrush/Beargrass communities are the only ones where snowbrush average cover that exceeds 2%.

Plant Association Predictability:
The Snowbrush-Chinquapin community is found on 6 plant associations. Pacific silver fir/Dwarf Oregongrape is the most common (17 of 26 plots, 6 of 12 sites). The following table may help to determine parent plant association for a site. TRLA2 occurred only on the Pacific silver fir/Dwarf Oregongrape and Pacific silver fir/Vine maple/Coolwort foamflower plant associations, and was found on most Pacific silver fir/Dwarf Oregongrape sites. Rhododendron occurred only on the Pacific silver fir/Rhododendron/Beargrass plant association (sample of only one plot). Beargrass occurred primarily on the cold Pacific silver fir/Big huckleberry/Beargrass plant association.

		Common or Key Shrubs and Forbs (%cover/%constancy)						
# Plots	Plant Association	CEVE	RHMA	CACH	ACCI	TRLA2	PTAQ	XETE
17	ABAM/BENE	20/100	0/0	14/71	5/59	1/88	9/65	+/18
2	ABAM/VAME/XETE	6/100	0/0	3/50	3/50	0/0	2/50	5/100
2	ABAM/VAME/CLUN	13/100	0/0	1/50	8/100	0/0	1/50	0/0
3	ABAM/ACCI/TIUN	27/100	0/0	3/67	16/100	1/33	1/67	0/0
1	ABAM/RHMA/BENE	10/100	0/0	0/0	0/0	0/0	1/100	0/0
1	ABAM/RHMA/XETE	5/100	25/100	5/100	0/0	0/0	0/0	+/100

+ = Trace amount

Early Seral Pathways:
The Snowbrush-Chinquapin community was found mostly on broadcast-burned 25-35 year old sites; one plot was located on a 15-year old site. Snowbrush-Chinquapin appears to be a common community established on broadcast-burned sites in the Pacific silver fir/Dwarf Oregongrape plant association in particular.

Invading species such as snowbrush, fireweed, pearly everlasting, and thimbleberry are still common, indicating that the Snowbrush-Chinquapin community is a very early seral stage. It may be followed by the Chinquapin-Oregon boxwood community, as tree cover shades and decreases the amount of snowbrush, and chinquapin persists or increases in cover.

Snowbrush/Beargrass
Ceanothus velutinus/Xerophyllum tenax
CEVE/XETE

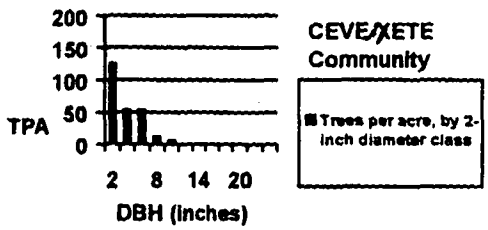
18 plots located on 9 sites

Vegetation: Structure and Composition:
This early seral community occurs in young stands, in which trees are not yet well established. The average age (18) is younger than most early seral communities, and cover of trees >12 feet tall is among the lowest. Shrub cover is established, particularly snowbrush (CEVE), but total shrub cover is less than in most communities. Beargrass (XETE) and fireweed (EPAN) dominate the forb layer, occurring on most plots, with pearly everlasting (ANMA) and twinflower (LIBO2) as common associates. CEVE is the predominant shrub, with Oregon boxwood (PAMY), dwarf Oregongrape (BENE), and big huckleberry (VAME) also occurring on most plots.

Species	Code	% Constancy	% Cover
Shrubs:			
Snowbrush	CEVE	100	12
Oregon boxwood	PAMY	78	5
Trailing blackberry	RUUR	78	4
Dwarf Oregongrape	BENE	78	3
Big Huckleberry	VAME	78	2
Forbs:			
Beargrass	XETE	100	12
Fireweed*	EPAN	94	1
Pearly everlasting*	ANMA	78	1
White hawkweed	HIAL	61	1
Twinflower	LIBO2	56	6

*= Invading species
+ = Trace present

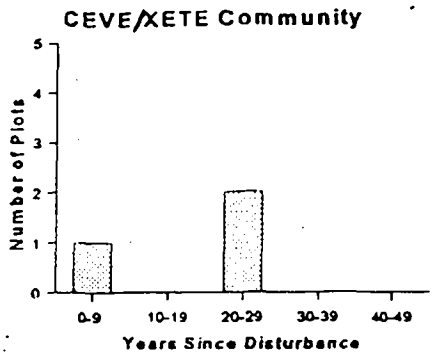
Douglas-fir (PSME), noble fir (ABPR), and western white pine (PIMO) are the most common tree species. Western hemlock (TSHE) and mountain hemlock TSME) each occur on about onf-fourth of plots. Several other species occur in minor amounts. Trees are relatively small, most being 6 inches in dbh or less.



Environment and Distribution:
The Snowbrush/Beargrass community is found on mesic and dry Pacific Silver Fir Zone plant associations, and occurs on both cold and warm sites. Sampling sites are located in the White River, Upper Clackamas, Oak Grove Fork Clackamas, and Warm Springs watersheds. The average elevation of 3880 feet is mid-range for Pacific silver fir early seral communities.

Elevation (ft.):	3880 (3500-4240)
Common Aspects:	Variable
Slope (%):	8 (1-25)
Topographic Position:	Mainly on ridgetops, upper and middle slopes. Also occurs on benches and flats.

Management Information: (From 3 sites) Age since regeneration harvest can vary a great deal in this community. Fuels were treated by broadcast burn on two sites, pile and burn on the third site. Burn intensities were recorded as light to moderate.



Management Considerations:
The Snowbrush/Beargrass community occurs in plant communities that have moderate to low productivity, for the Pacific Silver Fir Zone. Minor tree species that are present, such as western white pine, can be maintained during thinning operations, along with Douglas-fir and noble fir. Bough harvesting may be a good potential in these stands, which contain good amounts of both noble fir and western white pine. Although snowbrush dominates the shrub layer, big huckleberry was found on about 80% of plots, so huckleberries may be a potential special forest product on some sites. Big huckleberry will probably increase over time on Snowbrush/Beargrass. Although beargrass cover and constancy are heavy, quality for special forest products is most likely poor in these open stands.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderately high. Wildlife trails were observed on many plots. Snowbrush, Oregon boxwood, and big huckleberry provide high quality forage for ungulates and various other wildlife species. Trailing blackberry and dwarf Oregongrape also provide moderate quality browse. The forb layer provides small amounts of additional forage. Beargrass and fireweed are readily grazed by herbivores. Density of tall shrubs and trees is usually not high enough to provide hiding or thermal cover for ungulates and other large mammals. This community would be primarily used for foraging where hiding cover was nearby.

These sites are primarily in the shrub to open sapling-pole stand conditions. Though not dense, the mix of low and tall shrubs and young trees creates diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. Big huckleberry, trailing blackberry, snowbrush, and dwarf Oregongrape all provide fruit that attracts many species of wildlife including, songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed provides seeds for small mammals. Fireweed and Oregongrape provide nectar for hummingbirds. Lodgepole pine and western white pine provide high quality seeds for many species of birds and mammals. These species occur on some sites and will provide seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Most of the sites had no snags. Those snags that were present were generally less than 5 inches dbh. Down wood occurred at low levels and logs were usually less than 10 inches diameter. Remnant logs greater than 15 inches were rare. Wildlife dependent on snags and logs would be rare on these sites as existing woody debris is too small and sparse. Current harvest practices leave more large woody debris; thus,

the Snowbrush/Beargrass community sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
The Snowbrush-Chinquapin community contains similar amounts of snowbrush, but has much smaller amounts of beargrass and big huckleberry (each occur on about 20% of plots in the Snowbrush-Chinquapin community). The Chinquapin/Beargrass community contains very little snowbrush; prince's pine (CHUM) is also present, a species almost absent from the Snowbrush/Beargrass community. The Big huckleberry/Beargrass community lacks snowbrush and trailing blackberry (RUUR). The Beargrass community contains little snowbrush (2% cover on about 20% of plots).

Plant Association Predictability:
The Snowbrush/Beargrass community occurs primarily on the colder and drier portion of the Pacific Silver Fir Zone, with 12 of the 18 plots located in the Pacific silver fir/Big huckleberry/Beargrass or Pacific silver fir/Big huckleberry/Queencup beadlily associations. Pacific silver fir/Big huckleberry/Beargrass is the most common, occurring on eight plots. Six plots were located in the Pacific silver fir/Dwarf Oregongrape association, with four located in the Pacific silver fir/Big huckleberry/Queencup beadlily association.

Plot data revealed no clear differences in plant composition between sites located in different plant associations. Snowbrush was more common on the Pacific silver fir/Big huckleberry/Beargrass association than on the others. However, this could be more closely related to disturbance (fire) with this species.

		Common Shrubs and Forbs (%cover/%constancy)				
# Plots	Plant Association	VAME	CEVE	XETE	EPAN	ANMA
8	ABAM/VAME/XETE	2/75	28/100	13/100	+/100	+/75
6	ABAM/BENE	2/67	10/100	14/100	1/83	+/83
4	ABAM/VAME/CLUN	3/100	17/100	8/100	+-1/100	+/75

+ = Trace amount

Early Seral Pathways

The Snowbrush/Beargrass community occurs on sites where disturbance, primarily fire, has allowed the establishment of a significant amount of CEVE, and where relatively cold conditions favor dominance of XETE in the herb layer.

Snowbrush/Beargrass appears to be a very early seral community. The community may develop within 5-10 years of harvest, and may persist until age 30 or older, depending on the development of the young forest stand. Communities that may follow Snowbrush/Beargrass, by plant association, are shown in the following table:

Plant Association	Communities that may follow CEVE/XETE in succession	Remarks
ABAM/VAME/XETE	CEVE-CACH	CEVE-CACH may follow on disturbed sites, where CACH increases in cover following resprouting and growth.
	CACH/XETE	CACH/XETE may follow CEVE/XETE on a few, colder sites, which contain relatively little CEVE, or on which CEVE decreases.
ABAM/BENE	CACH/XETE CEVE-CACH	Both communities are very common in ABAM/BENE, and have fewer colonizing species. CACH/XETE may follow on colder sites, where disturbance allows CACH to increase; the CEVE-CACH community may occur where CEVE persists and CACH increases.
ABAM/VAME/CLUN	CEVE-CACH	

Fireweed
Epilobium angustifolium
EPAN

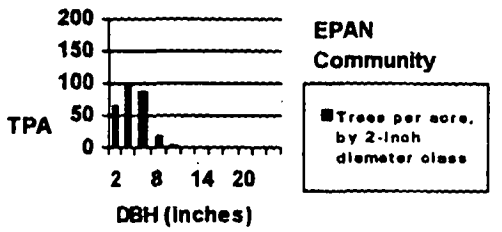
15 plots, located on 15 sites

Vegetation Structure and Composition:
This community occurs in very young stands that are very open, with the tree layer not well established. Cover of trees > 12 feet tall averages about 7 percent. Fireweed (EPAN) dominates the forb layer. Pearly everlasting (ANMA) and sometimes broadleaf lupine (LULA) are common in addition to fireweed, and can also occur in heavy amounts. The shrub layer may at times have a significant amount of vine maple on sites that had little or no impact from fire. Shrub cover is variable but generally not well developed.

Species	Code	% Constancy	% Cover
Shrubs:			
Trailing blackberry	RUUR	67	4
Dwarf Oregon grape	BENE	67	2
Rhododendron	RHMA	60	3
Big Huckleberry	VAME	53	5
Thimbleberry*	RUPA	53	2
Oregon Boxwood	PAMY	47	4
Vine Maple	ACCI	40	12
Forbs:			
Fireweed*	EPAN	100	26
Pearly Everlasting*	ANMA	80	5
Dogwood Bunchberry	COCA	47	3
Beargrass	XETE	40	6
Broadleaf lupine*	LULA	40	2
Sedges:			
Thick-headed sedge	CAPA	20	24
Long-stolon sedge	CAPE5	20	17

* = Invading species

Douglas-fir (PSME), noble fir (ABPR) and western hemlock (TSHE) were the most common trees in sample points; eight other species are present in smaller amounts. Most trees average 6 inches dbh or less; The EPAN community has the smallest tree size of all early seral communities.



Environment & Distribution:
The Fireweed community occurs on seven plant associations. It is most common on mesic sites.

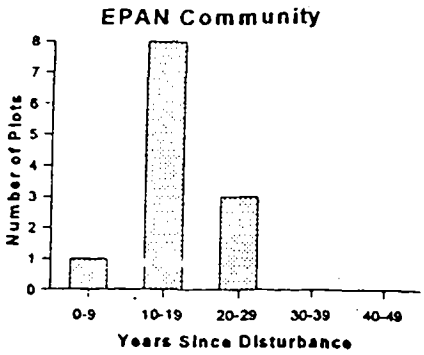
Elevation (ft.):	3644 (2960-4360)
Common Aspects:	Varies
Slope (%):	31 (0-75)
Topographic Position:	Upper slopes and ridgetops

The Fireweed community is an early, grass-forb community. Its development appears more closely tied to site disturbance than to the parent plant association. The community occurs where disturbance, usually fire, creates extensive mineral soil exposure.

The Fireweed community is located across the Forest. Sample sites are located in the Lower Clackamas, Oak Grove Fork Clackamas, South Fork Clackamas, West Fork Hood River, and Salmon River watersheds. The average elevation of 3644 feet is lower mid-range for Pacific Silver Fir Zone early seral communities.

Management information: (13 sites)

Stands are younger (time since regeneration harvest) than most early seral communities, with the majority being less than 20 years old. Fuel treatments have been predominantly broadcast burns, with no burning on two sites (from information available on nine sites). Burn intensities were light to moderate.



Management Considerations:
Most stands in the Fireweed community are young plantations, in the grass-forb or shrub stage. A wide range of species can be appropriately managed for in reforestation or precommercial thinning, including Douglas-fir, noble fir, western hemlock, and Pacific silver fir. The vigorous forb layer results in high forage production. The predominance of fireweed may make sites ideal for apiary permits. Stands may have potential for commercial tree bough production, although generally they are probably too young. Potential huckleberry production is good.

Wildlife habitat relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was generally low, but variable. Wildlife trails were not observed on any plots. Vine maple, Oregon boxwood, big huckleberry, and thimbleberry provide high quality forage for ungulates and various other wildlife species but occur in small amounts. Dwarf Oregongrape and trailing blackberry provide low to moderate quality browse. The forb layer provides significant amounts of forage. Beargrass, fireweed, bunchberry dogwood, and lupine are readily grazed by herbivores. Density of tall shrubs and trees is usually not high enough to provide hiding or thermal cover for ungulates and other large mammals.

These sites are primarily in the grass-forb to shrub stand conditions. The shrub layer is not particularly dense but the mix of low and tall shrubs provides cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. On some sites, rocks provide cover for small mammals and reptiles. Big huckleberry, dwarf Oregongrape, vine maple, trailing blackberry, thimbleberry, and bunchberry dogwood provide fruit that attracts many species of wildlife including songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed, lupine, and sedges provide seeds for small mammals and birds. Fireweed, lupine, red-flowering currant (on some sites), and Oregongrape provide nectar for hummingbirds.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Snags were absent on many plots. Those snags that were present were generally at low densities and less than 5 inches dbh. Down wood occurred at low densities and logs were generally less than 10

inches dbh. Wildlife dependent on snags and down logs would be rare on these sites as existing coarse woody debris occurs at low densities and is too small. Current harvest practices leave more large woody debris; thus, the EPAN sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
The Beargrass community can be similar to and in some cases will follow the Fireweed community in succession. The Beargrass community lacks the heavy cover of invading forbs, particularly fireweed, and trees are usually further along in establishment. The Thimbleberry/Fireweed (RUPA/EPAN) community is quite similar but represents a later stage of development, and probably was disturbed more lightly. Thimbleberry/Fireweed has a more developed shrub layer including higher amounts of thimbleberry and/or snowberry (SYAL). The tree layer is also more established with an average cover (trees greater than 12 feet tall) of about 13 percent. Invader species that take longer to become established such as thimbleberry, bracken fern (PTAQ), and strawberries (FRVE and FRVI) are more prevalent in the Thimbleberry/Fireweed community.

Plant Association Predictability:
Seven plant associations were encountered, with Pacific silver fir/rhododendron/beargrass (ABAM/RHMA/XETE) being most common. Predictability of plant association based on early seral vegetation appears very difficult. The vegetation is probably more strongly linked to disturbance than the site itself. Plant associations are best determined by visiting adjacent mature forest sites. The following table may also help estimate parent plant association:

		Common Shrubs and Forbs (%cover/%constancy)					
# Plots	Plant Association	RUUR	BENE	RHMA	VAME	EPAN	ANMA
6	ABAM/RHMA/XETE	5/70	1/70	3/70	3/70	21/100	6/83
3	ABAM/VAAL/COCA	3/67	1/33	+/33	0/0	10/100	5/67
2	ABAM/BENE	5/50	5/100	6/100	2/50	23/100	1/50
1	ABAM/VAME/XETE	8/100	+/100	3/100	1/100	17/100	1/100
1	ABAM/OXOR	+/100	0/0	0/0	+/100	45/100	2/100
1	ABAM/TIUN	0/0	5/100	0/0	0/0	5/100	5/100
1	ABAM/VAME/CLUN	+/100	+/100	2/100	25/100	25/100	+/100

+ = Trace amount

Early Seral Pathways:
The EPAN community was found on 7 plant associations, with Pacific silver fir/Rhododendron/Beargrass being the most common. The associations represent the mid-range of environmental conditions for the Pacific Silver Fir Zone.

The Fireweed community may be followed by a number of early seral communities. Due to the lack of snowbrush within this community, residual shrubs become dominant as the shrub layer develops. The community that develops may depend on the plant association, and the residual shrubs present following disturbance:

Plant Association	**Communities that may follow EPAN in succession**	**Remarks**
ABAM/RHMA/XETE	RHMA	On sites containing RHMA within the EPAN community.
	VAAL-RHMA	Some sites within ABAM/RHMA/XETE also have a component of VAAL in the shrub layer. These sites probably develop into the VAAL-RHMA community.
	ACCI-PAMY	Sites within ABAM/RHMA/XETE with significant ACCI and PAMY in the shrub layer
	VAAL-RHMA, VAAL-ACCI/COCA	On sites containing significant amounts of VAAL within the EPAN community.
ABAM/BENE	RUPA-EPAN	Sites contain no or little VAAL, greater amounts of RUPA than VAAL-RHMA and RHMA communities.
	ACCI-PAMY	Sites containing ACCI and PAMY in the shrub layer
	CACH-XETE	On colder sites
ABAM/VAME/CLUN	XETE or	Generally represent colder sites
ABAM/VAME/XETE	CACH-XETE	
ABAM/TIUN	RUPA-EPAN	On more productive sites.

Twinflower-Beargrass
Linnaea borealis-Xerophyllum tenax
LIBO2-XETE

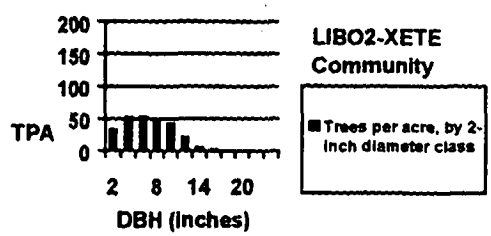
12 plots located on 8 sites

Vegetation Structure and Composition:
Twinflower (LIBO2) and beargrass (XETE) dominate the forb layer. The establishment of twinflower indicates either a longer time period since disturbance, and/or low fire impacts allowing twinflower to persist on the site. The shrub layer is generally neither dense nor very tall. Big huckleberry (VAME), trailing blackberry (RUUR), and small amounts of rhododendron (RHMA) are common, as are low shrubs wintergreen (GAOV) and dwarf bramble (RULA).

Species	Code	% Constancy	% Cover
Shrubs:			
Wintergreen	GAOV	100	5
Big huckleberry	VAME	92	8
Trailing blackberry	RUUR	83	5
Rhododendron	RHMA	83	2
Oregon boxwood	PAMY	75	5
Dwarf bramble	RULA	67	4
Forbs:			
Beargrass	XETE	100	25
Twinflower	LIBO2	100	16
Pearly everlasting*	ANMA	83	2
Fireweed*	EPAN	83	2
Bracken fern*	PTAQ	67	8
Dogwood bunchberry	COCA	58	6

\+ = Trace amount
* = Invading species

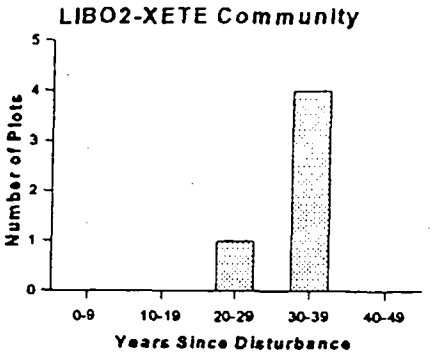
This community tends to occur on "older" early seral stands, and thus the tree layer is generally well established. Most trees are 12 inches dbh or smaller, with a few as large as 16 inches; cover of trees > 12 feet tall averages 28 percent. Although Douglas-fir (PSME) is the most common larger tree, western white pine (PIMO) and lodgepole pine (PICO) > 12 feet tall are also occur on 2/3 of the plots. Ten other tree species occur in smaller amounts.



Environment and Distribution:
The Twinflower-Beargrass community is found mostly on the cold, dry end of the spectrum for the Pacific Silver Fir Zone, on sites of relatively low productivity. The persistence of beargrass, western white pine, and lodgepole pine on this older community indicates that it occupies cold sites. Sampling sites where this community was identified are on both sides of Mt. Hood, in the Salmon River and Middle Fork Hood River watersheds. The average elevation of 3742 feet was mid-range for Pacific Silver Fir Zone early seral communities.

	Average	Range
Elevation (ft.):	3742	3400-4000
Common Aspects:	East and West	
Slope (%):	23	6-49
Topographic Positions:		Mid, upper, and lower slopes, ridgetops

Management Information: (6 sites)
Timber harvest usually occurred over 30 years ago. Fuel treatments included both broadcast burn and piling and burning. Burn intensities varied from light to high (one pile and burn site was described as high intensity).



Management Considerations:
The Twinflower-Beargrass coummunity occurs most commonly on colder, relatively unproductive plant associations, such as Pacific silver fir/Rhododendron/Beargrass (ABAM/RHMA/XETE) and Pacific silver fir/Big huckleberry/Beargrass (ABAM/VAME/XETE). Stands are open, and lightly stocked with trees. Some will be too open to require precommercial thinning. Trees are usually too small for commercial thinning opportunities.
Few plants have enough cover for special forest products opportunities.
Forage value is relatively low in these sites.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was the highest of any of the Pacific Silver Fir Zone early seral communities. Wildlife trails were common on plots. Oregon boxwood and big huckleberry provide high quality forage for ungulates and various other wildlife species. Wintergreen and trailing blackberry also provide low to moderate quality browse. The forb layer provides a significant amount of forage. Beargrass, fireweed, bunchberry dogwood, and twinflower are readily grazed by herbivores. The tree layer is generally well developed enough to provide some hiding cover for ungulates and other large mammals.

These sites are primarily in the open sapling-pole stand condition. The mix of low and tall shrubs and trees creates diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. Big huckleberry, trailing blackberry, and bunchberry dogwood provide fruit that attracts many species of wildlife including, songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed provides seeds for small mammals and nectar for hummingbirds. Lodgepole pine, western white pine, and ponderosa pine, provide high quality seeds for many species of birds and mammals. Pines are relatively common on these sites and will provide seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Snags were absent on many plots. Those snags that were present were generally at low densities and less than 8 inches dbh. Remnant snags greater than 20 inches were rare. Down wood occurred at moderate densities but logs were generally less than 10 inches dbh. Most plots had a few remnant logs greater than 15 inches in diameter. Wildlife dependent on snags would be rare on these sites as existing snags are too small. Species dependent on logs would not be abundant but should occur on many of these sites. Current harvest practices leave more large woody debris;

thus, the Twinflower-Beargrass community sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
As compared to the Beargrass community, the Twinflower-Beargrass community differs in that sites are generally older. Shrub species are better represented, and slower-establishing invaders such as pearly everlasting and bracken fern are more common and abundant, as is trailing blackberry. Twinflower is well established in the Twinflower-Beargrass community; this plant is generally absent in the Beargrass community.

Plant Association Predictability:
Most plots of this community were found within the Pacific silver fir/Rhododendron/Beargrass plant association. Single site occurrences were found, however, in four other plant associations.

Common Shrubs and Forbs
(%cover/%constancy)

# Plots	Plant Association	VAME	RHMA	RUUR	XETE	LIBO2	EPAN
7	ABAM/RHMA/XETE	10/100	3/100	7/100	24/100	20/100	3/86
2	ABAM/MEFE	10/100	0/0	2/50	40/100	6/100	1/100
1	ABAM/VAME/XETE	3/100	+/100	+/100	25/100	10/100	0/0
1	ABAM/RHMA/BENE	0/0	5/100	0/0	3/100	20/100	+/100
1	ABAM/VAAL/COCA	+/100	1/100	1/100	25/100	8/100	+/100

+ = Trace amount

Early Seral Pathways:
Potential pathways are difficult to estimate. On the Pacific silver fir/Rhododendron/Beargrass plant association, the Twinflower-Beargrass community may follow the Rhododendron or Beargrass communities, as cover of twinflower increases and invading shrubs decrease.

Devil's Club/Oregon Oxalis
Oplopanax horridum/Oxalis oregana
OPHO/OXOR

16 plots located on 7 sites

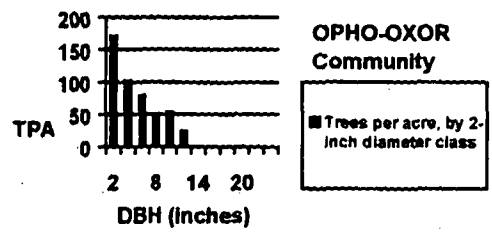
Vegetation: Structure and Composition:

This community has a well developed shrub and tree layer. Residual species that indicate moist and somewhat warmer conditions (for the Pacific silver fir zone), such as devil's club (OPHO), salmonberry (RUSP), red huckleberry (VAPA), Oregon oxalis (OXOR), swordfern (POMU), starry solomonplume (SMST), coolwort foamflower (TIUN), deerfern (BLSP), dogwood bunchberry (COCA), inside-out-flower (VAHE), western redcedar (THPL), and red alder (ALRU) are well represented. Thimbleberry (RUPA), pearly everlasting (ANMA), and fireweed (EPAN) are the most common invader species present in this community. OXOR and/or OPHO are always present. Vine maple (ACCI), Alaska huckleberry

(VAAL), VAPA, and trailing blackberry (RUUR) are common and often heavy. The most common tree species present are western hemlock (TSHE), Douglas-fir (PSME), THPL, and Pacific silver fir (ABAM). Most trees are 10 inches dbh or smaller; a few trees are as large as 16-18 inches in diameter.

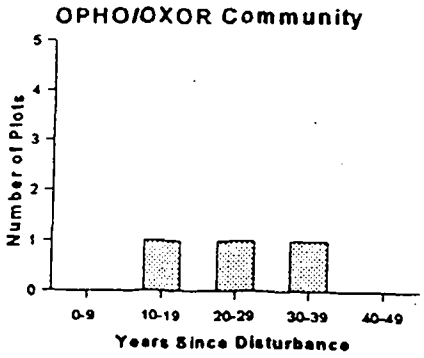
Species	Code	% Constancy	% Cover
Shrubs:			
Alaska huckleberry	VAAL	81	30
Vine maple	ACCI	81	17
Devil's club	OPHO	81	5
Trailing blackberry	RUUR	69	17
Red huckleberry	VAPA	69	7
Salmonberry	RUSP	63	10
Thimbleberry*	RUPA	63	9
Forbs:			
Oregon oxalis	OXOR	88	20
Fireweed*	EPAN	88	4
Western swordfern	POMU	88	3
Pearly everlasting*	ANMA	81	2
Dogwood bunchberry	COCA	75	18
Starry solomonplume	SMST	75	8
Coolwort foamflower	TITRU	75	5
Deerfern	BLSP	69	5

*= Invading species
+ = Trace present



Environment and Distribution:
The Devil's Club/Oregon Oxalis community is located on warm, moist or wet sites within the Pacific Silver Fir Zone. Usually these sites will be located within riparian zones or forested wetlands (seeps and springs, and other areas with high water tables). Plots were located in the Bull Run and Sandy River watersheds. Elevations are low for the Pacific Silver Fir Zone.

Elevation (ft.):	2913 (2700-3200)
Common Aspects:	Variable; insufficient data
Slope (%):	Variable
Topographic Position:	Mainly mid-slopes, some upper slopes and ridgetops.



Management Information: (3 sites)
Age since regeneration harvest varies a great deal in this community. Fuels treamtnes consisted of slash piling on all sample sites. Burn intensities were recorded as low to moderate.

Management Considerations:
The Devil's Club/Oregon Oxalis community is located on plant associations that are generally productive. Soils are commonly saturated, or at least moist. The abundance of water and high forage values make these sites excellent wildlife habitat. Huckleberry production (Alaska, red, and ovalleaf huckleberry) may be very good, where sites are still open enough for berries to develop on plants. These sites have excellent potential for development of large diameter trees, where spacing is adequate.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was generally low but variable. Wildlife trails were rarely observed. Vine maple, red huckleberry, thimbleberry, and salmonberry provide high quality forage for ungulates and various other wildlife species. Alaska huckleberry, devil's club, trailing blackberry, and red alder provide low to moderate quality browse. The forb layer provides additional forage. Oxalis, fireweed, swordfern, bunchberry dogwood, coolwort foamflower, and deerfern are readily grazed by herbivores. Vine maple, thimbleberry, salmonberry and young trees provide summer thermal and hiding cover for ungulates and other large mammals.

These sites are primarily in the open sapling-pole stand condition. The mix of low and tall shrubs and young trees creates diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. Red alder provides high quality habitat for birds. Vine maple, trailing blackberry, huckleberries, salmonberry, thimbleberry, devil's club, starry solomonplume, and bunchberry dogwood provide fruit that attracts many species of wildlife including songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed and oxalis provide seeds for small mammals. Fireweed and salmonberry provide nectar for hummingbirds.

The amount and size of large woody debris (snags and logs) are dependent on the amount left after harvest and site preparation. Most plots had low densities of snags that were less than 8 inches dbh. Down wood occurred at moderate levels in a diversity of size classes. Remnant logs greater than 20 inches occurred on most plots. Wildlife dependent on snags would be rare on these sites as existing snags are too small. Species dependent on logs would not be abundant but should occur on many of these sites. Current harvest practices leave more large woody debris; thus, the Devil's Club/Oregon Oxalis sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
The Devil's Club/Oregon Oxalis community could be considered a subset of one of the Alaska huckleberry (VAAL) communities. High cover and constancy of Alaska huckleberry, vine maple, and dogwood bunchberry are common in both Devil's Club/Oregon Oxalis and in these communities. The Devil's Club/Oregon Oxalis community, however, has a higher occurrence of classic moist indicating species, in particular devil's club, salmonberry, deerfern, Oregon oxalis, swordfer, and coolwort foamflower, while at the same time lacking various drier site species present in the other.

Plant Association Predictability:
The Devil's Club/Oregon Oxalis community was found across four plant associations, with Pacific silver fir/Alaska huckleberry-salal (ABAM/VAAL-GASH) being most common. Predictability of plant association beyond this may have low reliability, as sample size in some plant associations is small.

		Common Shrubs and Forbs (%cover/%constancy)						
# Plots	Plant Association	VAAL	ACCI	OPHO	OXOR	EPAN	POMU	ANMA
8	ABAM/VAAL-GASH	17/75	23/63	7/100	19/88	1/88	4/100	+/88
3	ABAM/OXOR	57/100	6/100	1/33	23/100	11/100	1/100	1/67
3	ABAM/MEFE	37/100	18/100	2/100	23/100	3/100	5/33	4/100
2	ABAM/VAAL/COCA	5/50	15/100	1/100	10/50	5/50	2/100	1/50
	+ = Trace amount							

Early Seral Pathways
The Devil's Club/Oregon Oxalis community probably does not succeed nor is it successional to other early seral communities. Strong populations of residual tall shrubs, such as vine maple and Alaska huckleberry, indicate that these sites will respond to disturbance by re-development of residual site species.

Bracken fern-Glaucous penstemon
Pteridium aquilinum-Penstemon euglaucus
PTAQ-PEEU

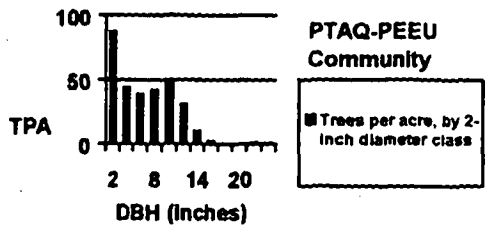
24 plots, located on 6 sites

Vegetation: Structure and Composition:
The tree and forb layers are well developed; grand fir is the most common tree species on this east-side community. Broadleaf lupine (LULA), white hawkweed (HIAL), bracken fern (PTAQ) and broadpetal strawberry (FRVI)are the most common species in a diverse forb layer. Baldhip rose (ROGY) and big huckleberry (VAME) are the only shrubs occurring on a majority of plots, although several others occur on at least 1/3 of plots, including trailing snowberry (SYMO), sticky currant (RIVI), and dwarf bramble (RULA).

Species	Code	% Constancy	% Cover
Shrubs:			
Baldhip rose	ROGY	63	2
Big huckleberry	VAME	54	3
Snowberry (trailing)	SYMO	46	6
Sticky currant	RIVI	42	5
Oregon Boxwood	PAMY	42	2
Prickly currant	RILA	42	+ TO 1
Forbs:			
Broadleaf lupine	LULA*	79	2
White hawkweed	HIAL	75	+ TO 1
Bracken fern	PTAQ	71	23
Broadpetal strawberry	FRVI*	71	5
Glaucous penstemon	PEEU*	63	14
Scouler's bluebell	CASC2	54	1
Pearly everlasting	ANMA*	50	2

* = Invading species
+ = Trace present

Douglas-fir (PSME) is the most common species. Grand fir (ABGR), western white pine (PIMO) and noble fir (ABPR) also occur on more than 1/2 of the plots. A total of 15 tree species were recorded on at least one plot. Most trees are 12 inches dbh or smaller, with a few as large as 22 inches in diameter.

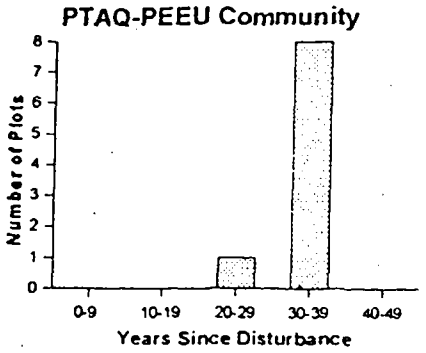


Bracken fern-Glaucous penstemon is the most species-rich early seral plant community; 163 plant species were recorded during sampling.

Environment and Distribution:
Most sites are located in the Pacific silver fir/Big huckleberry/Queencup (ABAM/VAME/CLUN) plant association, which has moderate productivity for the Pacific Silver Fir Zone. Most sample sites in this community are located east of the Cascades, in the Rock Creek-Threemile, East and Middle Fork Hood River, White River, and Miles creek watersheds. The average elevation of 3990 feet makes it one of the higher early seral communities.

Elevation (ft.):	3990 (3200-4500)
Common Aspects:	Southeast and east
Slope (%):	16 (3-60)
Topographic Position:	Mid-slopes, some upper slopes and ridgetops.

Management Information:
(9 sites)
Regeneration harvest occurred on most sites over 30 years ago. Fuel treatments consisted primarily of broadcast burning. Intensities varied from light to heavy; most were light or moderate.



The abundance of frost-sensitive bracken fern in the Bracken fern-Glaucous penstemon early seral community suggests that frost is uncommon during the growing season. The community presents abundant forage, but probably has poor potential for special forest products (particularly shrubs) because of heavy bracken fern, grass, and forb cover. Development of trees in this community has been slower than many, due largely to the competition from forbs and grasses.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderately high. Wildlife trails were observed on many plots. Big huckleberry, Oregon boxwood, and currant provide high quality forage for ungulates and various other wildlife species. Snowberry and baldhip rose also provide low to moderate quality browse. The forb layer provides some additional forage. Lupine, hawkweed, strawberry, and penstemon are grazed by herbivores. The tree layer is generally well developed enough to provide some hiding cover for ungulates and other large mammals.

These sites are primarily in the open sapling-pole stand condition. The shrub layer is not particularly dense but the mix of low and tall shrubs and young trees provides cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. On some sites, rocks provide cover for small mammals and reptiles. Big huckleberry, baldhip rose, currant, and strawberry provide fruit that attracts many species of wildlife including songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Lupine and penstemon provide seeds for small mammals and birds. Lupine, penstemon, and red-flowering currant (on some sites) provide nectar for hummingbirds. These sites support a variety of tree species including pines and western larch that provide diversity of high quality seeds for many species of birds and mammals. Pines and larch are relatively common on these sites and will provide an important source of seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Snags were absent on many plots. Those snags that were present were generally at low densities and less than 10 inches dbh. Down wood occurred at low densities and logs were generally less than 15 inches dbh. Remnant logs greater than 20 inches in diameter were rare. Wildlife species dependent on snags would be rare on these sites as existing snags are too small. Species dependent on logs would not be abundant but should occur on many of these sites. Current harvest practices leave more large woody debris; thus, the Bracken fern-Glaucous penstemon sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future. Pine and larch will provide snags preferred by cavity nesting wildlife.

Similar Early Seral Communities:
The abundance of bracken fern and glaucous penstemon distinguish this early seral community from others. Chinquapin-Oregon boxwood (CACH-PAMY), Snowbrush-Chinquapin (CEVE-CACH), and Chinquapin/Beargrass (CACH/XETE) all contain significant amounts of grand fir and may contain large amounts of bracken fern; however, they lack glaucous penstemon, and contain greater amounts of chinquapin.

Plant Association Predictability:
Most of this community is in the Pacific silver fir/Big huckleberry/Queencup beadlily plant association, with a few plots in the Pacific silver fir/dwarf Oregongrape (ABAM/BENE) association. Glaucous penstemon is very common in the Pacific silver fir/Big huckleberry/Queencup beadlily plant association(15 of 21 plots), and is absent in Pacific silver fir/dwarf Oregongrape. Trailing blackberry shows a strong presence in Pacific silver fir/dwarf Oregongrape (occurs on all 3 plots, ave. cover 10%) and is almost absent on the Pacific silver fir/Big huckleberry/Queencup beadlily plant association (2% cover on 1 of 21 plots).

The presence of significant amounts of ponderosa pine and grand fir indicates that this community is transitional to the Grand Fir Zone.

A rough key to plant associations:

1. PEEU present.....> ABAM/VAME/CLUN

1. PEEU absent.....>2

   2. RUUR + RUPA = > 4%,
      EPAN generally present,
      ABGR and PIPO absent.....> ABAM/BENE
   2. Not as above.....> ABAM/VAME/CLUN

		Common Shrubs and Forbs (%cover/%constancy)							
# Plots	Plant Association	ROGY	VAME	SYMO	LULA	HIAL	PTAQ	FRVI	PEEU
21	ABAM/VAME/CLUN	2/67	2/50	5/43	2/81	+/71	18/67	5/81	14/71
3	ABAM/BENE	+/33	3/33	7/67	1/67	+/33	47/100	0/0	0/0

+ = Trace amount

Early Seral Pathways
This community occurs almost exclusively (21 of 24 plots) on the Pacific silver fir/Big huckleberry/Queencup beadlily plant association. Bracken fern-Glaucous penstemon is one of the oldest early seral communities, yet has a less developed tree cover than many younger communities. The strong presence of bracken fern, plus persistence of other invading species such as pearly everlasting and fireweed, and low cover in many tall shrubs, indicate a persistent, forb-dominated community. Bracken fern-Glaucous penstemon appears to be a community of the east side, bordering on the grand fir zone (it contains more ponderosa pine and grand fir than other early seral communities). It most likely does not

follow, and is not followed by, other identified early seral communities.

Rhododendron
Rhododendron macrophyllum
RHMA

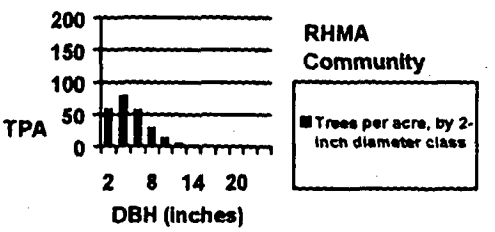
38 plots located on 23 sites

Vegetation: Structure and Composition:
A well developed shrub layer dominated by rhododendron (RHMA) is characteristic of this community. Small trees are generally abundant. Big huckleberry (VAME), wintergreen (GAOV), trailing blackberry (RUUR), Oregon boxwood (PAMY), Chinquapin (CACH) and small amounts of dwarf Oregongrape (BENE) are other shrubs often are present. The forb layer is dominated by beargrass (XETE) which is at least present on every plot and often heavy. Dogwood bunchberry (COCA) and twinflower (LIBO2) are also well represented residuals in many cases. Fireweed (EPAN), pearly everlasting (ANMA) and broadleaf lupine (LULA) are the primary invader species present, though their covers are generally low, probably as a result of the high shrub cover.

Species	Code	% Constancy	% Cover
Shrubs:			
Rhododendron	RHMA	100	26
Big huckleberry	VAME	79	5
Wintergreen	GAOV	74	10
Dwarf oregongrape	BENE	53	3
Trailing blackberry	RUUR	50	5
Oregon boxwood	PAMY	50	4
Chinquapin	CACH	47	7
Forbs:			
Beargrass	XETE	100	13
Dogwood bunchberry	COCA	29	9
Twinflower	LIBO2	29	7
Fireweed*	EPAN*	84	3
Pearly everlasting*	ANMA*	63	2
Broadleaf lupine*	LULA*	32	2

*= Invading species
+ = Trace present

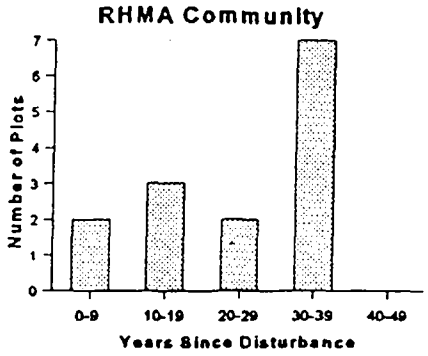
Douglas-fir (PSME), Pacific silver fir (ABAM), and western hemlock (TSHE) are the most common trees, occurring on over 1/2 of sample plots. Eight other tree species are present. Most trees are 8 inches dbh or smaller; a few may be as large as 14 inches in diameter.



Environment and Distribution:
The Rhododendron community is mainly found on drier sites within the Pacific Silver Fir Zone, but can occur in mesic and moist environments. The community is widespread across the Forest; sampling sites were located in the Oak Grove Fork Clackamas, Salmon River, West Fork Hood River, Middle Fork Hood River, and Hot Springs Fork Collawash River watersheds. The average elevation of 3623 feet is mid-range for Pacific silver fir early seral communities.

Elevation (ft.):	3623 (2200-4500)
Common Aspects:	Found on all aspects
Slope (%):	28 (1-62)
Topographic Position:	Mid and upper slopes

Management Information: (14 sites) The Rhododendron community stands vary considerably in age since regeneration harvest. Fuel treatments on these units consisted primarily of broadcast burn and slash piling, with isolated cases of no fuel treatment, or yarding of unutilized material. Burn intensities were recorded as not apparent to sometimes moderate.



Management Considerations:
Productivity is relatively low for this community, located primarily in the Pacific silver fir/Rhododendron/Beargrass (ABAM/RHMA/XETE) and Pacific silver fir/Rhododendron/Dwarf Oregongrape (ABAM/BENE) plant associations. Commercial or precommercial thinning operations should be able to maintain a diversity of tree species on most sites. Some sites have abundant amounts of big huckleberry, and may produce good huckleberry crops. Beargrass is abundant, probably of too low quality to be of interest to harvesters.
Sites with abundant rhododendron may be nitrogen deficient; care should be taken to protect organic matter and soil structure. Rhododendron coummunity sites may be good candidates for forest fertilization.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was relatively low but variable. Wildlife trails were rarely observed. Rhododendron, which predominated these sites, does not provide forage and at higher densities may become impenetrable by deer and elk. Big huckleberry, dwarf oregongrape and Oregon boxwood provide quality browse on some sites. The forb layer provides additional forage.

These sites are primarily in the open sapling-pole stand condition. The shrub layer is not particularly dense but the mix of low and tall shrubs and young trees provides cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. On some sites, rocks provide cover for small mammals and reptiles. Huckleberry, Oregongrape, trailing blackberry, and bunchberry dogwood provide fruit for many species of wildlife. Lupine and fireweed provide seeds for birds and small mammals. Fireweed, lupine and Oregongrape provide nectar for hummingbirds. Lodgepole pine and western white pine provide high quality seeds for many species of birds and mammals. These species occur on some sites and will provide seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Many of the sites had no snags. Those snags that were present were generally less than 8 inches dbh. Most down wood was less than 10 inches dbh, with logs greater than 15 inches dbh rare. Wildlife dependent on snags and down wood would be rare on these sites. Current harvest practices leave more large woody debris; thus, the Rhododendron sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
The Alaska huckleberry-Rhododendron (VAAL-RHMA) community also has large amounts of rhododendron, but in addition has abundant of Alaska huckleberry or ovalleaf huckleberry (VAOV), which occur rarely in the

Rhododendron community. Beargrass and especially big huckleberry are not as common in the Alaska huckleberry-Rhododendron community; otherwise, forb composition is similar between the two. The Alaska huckleberry-Rhododendron community generally indicates moister plant associations (ie. Pacific silver fir/Alaska huckleberry/Dogwood bunchberry and Pacific silver fir/Rhododendron-Alaska huckleberry/Dogwood bunchberry) whereas the Rhododendron community is usually drier (predominantly Pacific silver fir/Rhododendron/Beargrass and Pacific silver fir/Rhododendron/Dwarf Oregongrape).

Plant Association Predictability:
Although this community crossed six plant associations, most plots fell in either the Pacific silver fir/Dwarf Oregongrape association (61% of plots) or in the Pacific silver fir/Rhododendron/Beargrass association (16% of plots).

Determination of plant association is best done by visiting an adjacent stand. The following rough key may help, especially if nearby mature stands are not available.

1. Twinflower $\geq$ 5%
   ---> Pacific silver fir/Rhododendron/Dwarf Oregongrape
   (Chinquapin mostly minor, Twinflower usually present)
   ---> Pacific silver fir/Dwarf Oregongrape
   (Chinquapin common, Twinflower absent)
   ---> Pacific silver fir/Big huckleberry/Beargrass
   (Chinquapin common, Twinflower absent)

1. Twinflower < 5% ... could be any of following:
   ---> Pacific silver fir/Rhododendron/Beargrass
   ---> Pacific silver fir/Rhododendron-Dwarf Oregongrape
   (only one w/any twinflower present)
   ---> Pacific silver fir/Dwarf Oregongrape
   ---> Pacific silver fir/Big huckleberry/Beargrass
   ---> Pacific silver fir/Big huckleberry/Queencup beadlily
   ---> Pacific silver fir/Coolwort foamflowe

Common Shrubs and Forbs
(%cover/%constancy)

# Plots	Plant Association	RHMA	VAME	GAOV	BENE	XETE	EPAN	ANMA	HIAL
23	ABAM/RHMA/XETE	24/100	5/78	8/74	+ to 1/35	12/100	5/83	2/61	+ to 1/61
6	ABAM/RHMA/BENE	30/100	1/83	2/50	4/100	4/100	1/100	2/67	+/83
3	ABAM/BENE	23/100	8/67	14/100	6/67	17/100	+/33	+/33	0/0
2	ABAM/VAME/XETE	25/100	3/100	15/50	3/100	5/100	3/100	0/0	0/0
2	ABAM/VAME/CLUN	15/100	15/50	18/100	+ to 1/100	20/100	1/100	+/100	+/50
2	ABAM/TIUN	50/100	3/100	23/100	0/0	40/100	+/100	2/100	+/50

+ = Trace amount

Early Seral Pathways:
The Rhododendron community may be preceded by the Fireweed, Beargrass, or Big huckleberry/Beargrass community, or may develop immediately following timber harvest or other disturbance. Some sampled Rhododendron community sites were clearcut only 10 years before sampling. Sites that develop initially into the Rhododendron community probably did not receive fire or other ground disturbance, which tends to inhibit rhododendron. The Twinflower/Beargrass community may follow the Rhododendron community, where twinflower is present and increases due to disturbance.

Thimbleberry/Fireweed
Rubus parviflorus/Epilobium angustifolium
RUPA/EPAN

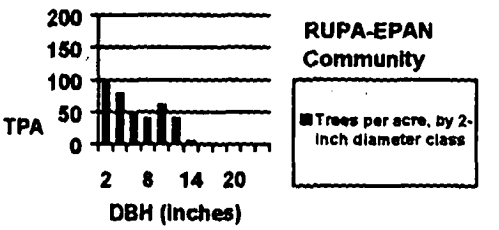
17 plots, located on 13 sites

Vegetation: Structure and Composition:
Steep south-facing slopes probably influence vegetation compostion. Shrub layer is moderate and dominated by warm site shrubs. The forb layer can be quite variable with few to many species present and warm site forbs common. Fireweed (EPAN) is common and often heavy. Trees are usually well established on these sites.

Species	Code	% Constancy	% Cover
Shrubs:			
Thimbleberry*	RUPA	94	15
Trailing blackberry	RUUR	88	4
Vine maple	ACCI	82	6
Snowberry (trailing)	SYMO	65	14
Common snowberry	SYAL	18	3
Big huckleberry	VAME	59	4
Baldhip rose	ROGY	59	1
Forbs:			
Fireweed*	EPAN	77	11
Pearly everlasting*	ANMA	65	2
White hawkweed	HIAL	59	1
Western starflower	TRLA2	53	2
Broadleaf lupine*	LULA	53	2
Western swordfern	POMU	53	1
Inside-out flower	VAHE	47	6

* = Invading species
+ = Trace present

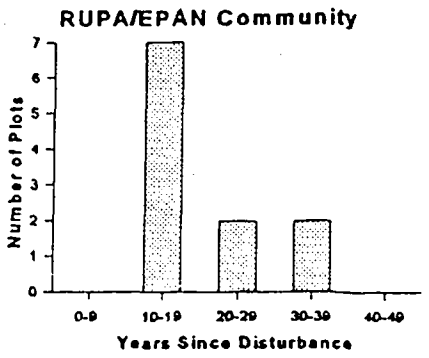
Douglas-fir (PSME), western hemlock (TSHE), and noble fir (ABPR) are the most common trees. Most trees are 12 inches dbh or smaller. Cover of trees > 12 feet tall averages 28 percent, but can vary greatly (5-70%).



Environment and Distribution:
The Thimbleberry/Fireweed community occurs on a wide variety of Pacific Silver Fir Zone sites,but appears most common on warmer plant associations, such as Pacific silver fir/Dwarf Oregongrape (ABAM/BENE). This community appears to occur mainly on the west side of the Cascades; eight sampling sites are located in the Bull Run, Collawash, Fish Creek, Lower Clackamas, South Fork Clackamas, and Salmon River watersheds. Three sites are located in the Middle Fork Hood River and White River watersheds. The average elevation of 3647 feet is mid-range for Pacific silver fir early seral communities.

Elevation (ft.):	3647 (2600-4300)
Common Aspects:	Variable; most southerly
Slope (%):	44 (6-80)
Topographic Position:	Mid and upper slopes, ridgetops

Management Information: (11 sites) Stands in the Thimbleberry/Fireweed community are relatively young; regeneration harvest occurred on most within the last 20 years. Fuel treatments for these sites varied, including broadcast burning, no burning, and pile burning. Burn intensities were light to heavy (moderate to heavy being common).



Management Considerations:
The Thimbleberry/Fireweed community occurs on a wide variety of Pacific silver fir plant associations, with a correspondingly wide productivity range. Species richness is also high; only the Bracken fer-Glaucous penstemon community contained a greater number of plant species than Thimbleberry/Fireweed. Noble fir has been planted on many sites; the potential for commercial boughs or Christmas trees may exist during or after precommercial thinning operations. Big huckleberry (VAME) may be abundant on some sites; open stands may provide good berry production. The Thimbleberry/Fireweed community sites may provide opportunities for apiary permits. The diverse array of forbs and shrubs provides good forage.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was low but variable. Wildlife trails were rarely observed. Thimbleberry, vine maple, and big huckleberry provide high quality forage for ungulates and various other wildlife species. Trailing blackberry, snowberry and baldhip rose provide low to moderate quality browse. The forb layer provides additional forage. Fireweed, hawkweed, lupine, and swordfern are readily grazed by herbivores. Thimbleberry, vine maple and young trees provide hiding and thermal cover for ungulates and other large mammals.

These sites are primarily in the open to closed sapling-pole stand conditions. The mix of low and tall shrubs and young trees creates diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. Vine maple, big huckleberry, snowberry, baldhip rose, trailing blackberry, and thimbleberry provide fruit that attracts many species of wildlife including songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed, lupine, and red-flowering currant (on some sites) provide seeds for small mammals and nectar for hummingbirds.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Snags were absent on most plots. Those snags that were present were generally at low densities and less than 8 inches dbh. Logs less than 15 inches in diameter occurred at moderate densities. Remnant logs greater than 20 inches occurred on most plots at low densities. Wildlife dependent on snags would be rare on these sites as existing snags are too small and sparse. Species dependent on logs would not be abundant but should occur on many of these sites. Current harvest practices leave more large woody debris; thus, the Thimbleberry/Fireweed sites should contain more

snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
The Fireweed community appears quite similar but seems to be younger with a less-developed shrub and tree layer.
Successionally, it may actually precede the Thimbleberry/Fireweed community in many cases.
The Vine maple-Oregon boxwood (ACCI-PAMY) community is a similar shrub community but has more abundant vine maple and Oregon boxwood. Thimbleberry and trailing snowberry play a minor role. The Vine maple-Oregon boxwood community also occurs on moderate to steep southerly slopes and within the same plant associations. Possibly Vine maple-Oregon boxwood reflects less intense burning.

Plant Association Predictability:
Plot data did not show clear differences between plant associations for the Thimbleberry/Fireweed community. Fireweed cover was 1% or less on most plots within the Pacific silver fir/Dwarf Oregongrape plant association (6 of 7), and exceeded 3% cover on all other plots, so light fireweed cover may indicate the Pacific silver fir/Dwarf Oregongrape association.

Determination of the site's plant association is best done by visiting nearby mature forest stands. The above information, and the following table, may help to narrow choices.

		Common Shrubs and Forbs (%cover/%constancy)							
# Plots	Plant Association	RUPA	RUUR	ACCI	SYMO	EPAN	ANMA	HIAL	TRLA2
7	ABAM/BENE	10/86	5/100	10/86	6/57	11/43	2/57	2/29	2/71
4	ABAM/RHMA/XETE	23/100	+ to 1/100	1/75	9/75	14/100	2/75	1/75	+/25
2	ABAM/ACCI/TIUN	20/100	0/0	10/100	38/100	12/100	+/50	+/50	3/50
2	ABAM/VAME/XETE	4/100	4/100	5/50	15/50	11/100	2/100	1/100	0/0
1	ABAM/RHMA-BENE	5/100	+/100	2/100	0/0	5/100	1/100	2/100	5/100
1	ABAM/TIUN	45/100	15/100	+/100	5/100	10/100	0/0	+/100	+/100

+ = Trace amount

Early Seral Pathways
The Thimbleberry/Fireweed community occurs on 6 plant associations, with most plots (11 of 17) on either Pacific silver fir/Dwarf Oregongrape or Pacific silver fir/Rhododendron/Beargrass. The high constancy and cover of thimbleberry and fireweed indicate that this community develops very early. Sampled sites ranged in age (since disturbance) from 11 to 42. It may follow EPAN, or establish itself soon after disturbance.
The Thimbleberry/Fireweed community may be followed by the Vine maple/Oregon boxwood or Alaska huckleberry-Vine maple/Dogwood bunchberry communities. Both of these communities have large amounts of vine maple, and significant (but decreasing) amounts of both thimbleberry and fireweed. The Devil's club/Oregon oxalis community has large amounts of vine maple, but occurs on more moist sites. Alaska huckleberry-Vine maple/Dogwood bunchberry would succeed Thimbleberry/Fireweed only on the few sites that contain Alaska huckleberry in the Thimbleberry/Fireweed community; Alaska huckleberry

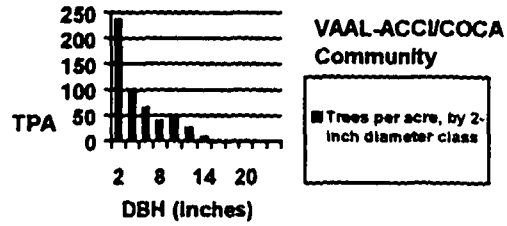
occurred on one Thimbleberry/Fireweed plot, in the Pacific silver fir/Rhododendron/Dwarf Oregongrape plant association.

Alaska huckleberry-Vine maple/Dogwood bunchberry
Vaccinium alaskaense-Acer circinatum/Cornus canadensis
VAAL-ACCI/COCA
17 plots, located on 10 sites

Vegetation: Structure and Composition:
Both shrubs and trees are well established on these sites. Vine maple (ACCI) and huckleberry species (Alaska, ovalleaf, big and red huckleberry), along with trailing blackberry (RUUR), dominate the shrub layer. Residual herbs are prominent in the forb layer and generally indicate moist conditions. Dogwood bunchberry (COCA) is common and often heavy on all plots. Bracken fern (PTAQ) is the most significant invader species and can be very abundant.

Species	Code	% Constancy	% Cover
Shrubs:			
Trailing blackberry	RUUR	88	8
Vine maple	ACCI	71	31
Thimbleberry*	RUPA	59	2
Red huckleberry	VAPA	47	4
Alaska huckleberry	VAAL	41	9
Big huckleberry	VAME	41	7
Oval-leaf huckleberry	VAOV	35	11
Forbs:			
Dogwood bunchberry	COCA	100	12
Starry solomonplume	SMST	77	4
Fireweed*	EPAN	77	3
Inside-out flower	VAHE	65	2
Pearly everlasting*	ANMA	65	1
Bracken fern*	PTAQ	59	9
Twinflower	LIBO2	59	7

*= Invading species
+ = Trace present

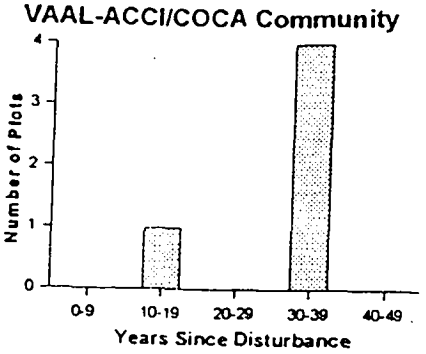


Douglas-fir (PSME), western hemlock (TSHE), and noble fir (ABPR) are the most common larger trees. TSHE is the prominent tolerant tree species; Western redcedar (THPL) is a common associate, occurring on over 50% of sampling plots.
Most trees are 10 inches dbh or smaller, with an occasional tree being 18 inches or larger.

Environment and Distribution:
Most plots occur on moderately productive, mesic (for the Pacific Silver Fir Zone) plant associations, or on the warm, dry end of the spectrum. Precommercial thinning has probably occurred on most of these sites. Slope and aspect information was only available for 6 plots in this community. Sampling sites are located across the Forest. Four sites are located in the West Fork Hood River watershed; 1 site each is located in the Middle Fork Hood River, Bull Run River, Salmon River, Sandy River, and Upper Clackamas River watersheds. The average elevation of 3200 feet makes this one of the lowest elevation communities.

Elevation (ft.):	3200 (2200-3800)
Common Aspects:	Aspects vary, but are predominantly northeast
Slope (%):	20 (1-55)
Topographic Position:	Mid to upper slopes

Management Information: (5 sites) Most sites were clearcut harvested over 30 years ago. Fuel treatments were variable, including no treatment, pile and burn, and broadcast burn. Burn intensities were negligible. Species presence and dominance may be in part attributed to the general lack of site burning and/or low burn intensities across this community.



Management Considerations:
Alaska huckleberry and big huckleberry (VAME) may occur in significant amounts on certain sites; managing for open tree canopies may help maintain huckleberry production. Frost is not likely to be a occur during the growing season. Forage is abundant; this community contains a wide variety of forbs and shrubs. It was exceeded only by the Bracken fern-Glaucous penstemon (PTAQ-PEEU) community in species richness.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderate but variable. Wildlife trails were rarely observed. Vine maple and huckleberries dominate these sites and provide good quality forage for ungulates and various other wildlife species. The forb layer provides small amounts of additional forage. The moderate slopes, moist conditions, and abundant shrub and small tree cover should provide for good summer thermal and hiding cover and thus good foraging and resting habitat for ungulates and other large mammals.

These sites are primarily in the open sapling-pole stand condition. The mix of low and tall shrubs and young trees creates diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. Huckleberry, vine maple, thimbleberry, trailing blackberry, and bunchberry dogwood provide fruit that attracts many species of wildlife including songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed provides seeds for small mammals and nectar for hummingbirds.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Many of the sites had no snags. Those snags that were present were generally less than 8 inches dbh, though a few sites had remnant snags greater than 15 inches dbh. Down wood occurred at moderate levels in a diversity of size classes. Remnant logs greater than 20 inches were relatively common. Wildlife dependent on snags would be rare on these sites as existing snags are too small and sparse. Species dependent on logs would not be abundant but should occur on many of these sites. Current harvest practices leave more large woody debris; thus, the Alaska huckleberry-Vine maple/Dogwood bunchberry community sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:

The Devil's club/Oregon oxalis (OPHO/OXOR) community is similar in the amount of Alaska huckleberry, vine maple, and dogwood bunchberry, which are key indicators of this type; however, The Devil's club/Oregon oxalis community has a greater concentration of moist to warm/moist species such as devil's club, Oregon oxalis, salmonberry, deerfern, and swordfern. Also, bracken fern is very uncommon in the Devil's club/Oregon oxalis community.

The high cover of Alaska huckleberry in the Alaska huckleberry-Vine maple/Dogwood bunchberry community is matched only by the Alaska huckleberry/Rhododendron community; however, Alaska huckleberry-Vine maple/Dogwood bunchberry does not have the common presence of rhododendron.

Plant Association Predictability:
The Alaska huckleberry-Vine maple/Dogwood bunchberry community was found across five plant associations, with Pacific silver fir/Alaska huckleberry/Dogwood bunchberry (ABAM/VAAL/COCA) and Pacific silver fir/Big huckleberry/Queencup beadlily (ABAM/VAME/CLUN) being most common. Data do not show sufficient differences to develop a key to parent plant associations; the best way to determine PA is to visit nearby mature stands. The following table of common plants (by plant association) may help to confirm choices.

		Common Shrubs and Forbs (%cover/%constancy)						
# Plots	Plant Association	RUUR	ACCI	RUPA	VAAL	COCA	SMST	EPAN
5	ABAM/VAAL/COCA	12/80	18/60	+ to 1/40	13/80	16/100	3/80	2/80
5	ABAM/VAME/CLUN	9/100	47/100	1/80	3/40	15/100	13/60	5/80
3	ABAM/RHMA/BENE	3/100	26/100	3/67	+ to 1/67	4/100	+ to 1/100	0/0
3	ABAM/BENE	6/100	5/33	3/33	5/33	11/100	+ to 1/100	2/100
1	ABAM/VAME/XETE	0/0	0/0	1/100	0/0	7/100	0/0	5/100

+ = Trace amount

Early Seral Pathways
The Alaska huckleberry-Vine maple/Dogwood bunchberry community occurred on 5 plant associations in this sample; the majority of plots (10 of 16) were split between Pacific silver fir/Big huckleberry/Queencup beadlily and Pacific silver fir/Alaska huckleberry/Dogwood bunchberry, with Pacific silver fir/Dwarf Oregongrape, Pacific silver fir/Rhododendron/Dwarf Oregongrape, and Pacific silver fir/Big huckleberry/Beargrass making up the balance.

Alaska huckleberry-Vine maple/Dogwood bunchberry is probably not followed by other early seral plant communities.

Alaska huckleberry-Rhododendron
Vaccinium alaskaense-Rhododendron macrophyllum
VAAL-RHMA

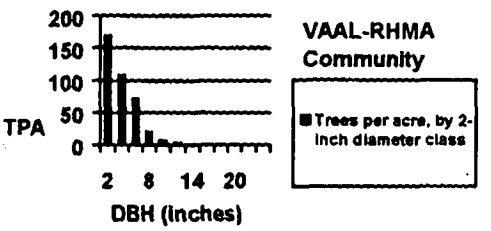
26 plots, located on 17 sites

Vegetation: Structure and Composition:
The tree, shrub, and forb layers are all well represented in this community. Rhododendron (RHMA) and Alaska huckleberry (VAAL) dominate the shrub layer. Dwarf bramble (RULA), wintergreen (GAOV), and trailing blackberry (RUUR) are often common associates. Three residual forbs, dogwood bunchberry (COCA), beargrass (XETE), and twinflower (LIBO2), commonly dominate the forb layer. Other moist site residual forbs, such as starry solomonplume (SMST), queencup beadlily (CLUN), and deerfern (BLSP) are also occasionally heavy and/or dominant. Fireweed (EPAN) and pearly everlasting (ANMA) are the common invader species present, with broadleaf lupine (LULA) or bracken fern (PTAQ) occasionally being prominent.

Species	Code	% Constancy	% Cover
Shrubs:			
Alaska huckleberry	VAAL	100	22
Rhododendron	RHMA	100	17
Dwarf bramble	RULA	58	7
Wintergreen	GAOV	42	7
Trailing blackberry	RUUR	42	5
Forbs:			
Dogwood bunchberry	COCA	77	13
Beargrass	XETE	69	10
Twinflower	LIBO2	50	7
Fireweed*	EPAN	81	6
Pearly everlasting*	ANMA	73	1

* = Invading species
+ = Trace present

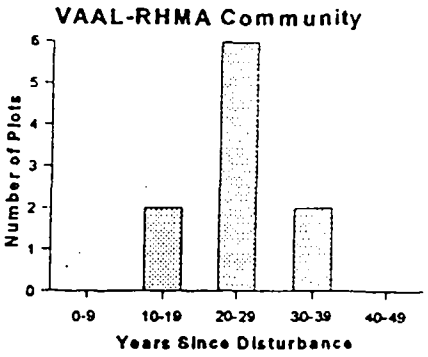
Douglas-fir (PSME), western hemlock (TSHE), noble fir (ABPR) and Pacific silver fir (ABAM) all occured on the majority of plots. Eight other species of trees occured in smaller amounts. Most trees were 8 inches dbh or smaller, with an occasional tree as large as 16 inches in diameter.



Environment and Distribution:
The Alaska huckleberry-Rhododendron community occurs primarily on three moderately productive plant associations. Pacific silver fir/Alaska huckleberry/Dogwood bunchberry (ABAM/VAAL/COCA), Pacific silver fir/Rhododendron/Dogwood bunchberry (ABAM/RHMA/COCA), and Pacific silver fir/Rhododendron/Beargrass (ABAM/RHMA/XETE) account for 13 of the 18 sample plots. This community is mostly located north and west of Mt. Hood; sampling sites are located in the Bull Run, West and Middle Forks of the Hood River, and the Salmon and Sandy River watersheds. The average elevation of 3411 feet makes this one of the lower Pacific Silver Fir Zone early seral communities.

Elevation (ft.):	3411 (2550-4100)
Common Aspects:	Northerly slopes
Slope (%):	26 (0-58)
Topographic Position:	Mid to upper slopes, ridgetops

Management Information: *(10 sites)* Age since harvest varies, with most being over 25 years. Fuel treatment for most sites was broadcast burning, with some slash piling. Burn intensities were light to moderate.



Management Considerations:
Sites with abundant rhododendron may be nitrogen deficient; care should be taken to protect soil organic material and soil structure. Alaska huckleberry-Rhododendron community sites may be good candidates for forest fertilization. Huckleberry production may be very good in open stands; Alaska huckleberry is more prevalent in this association than any other.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderate but variable. Wildlife trails were rarely observed. Rhododendron does not provide forage and at higher densities may become impenetrable by deer and elk. Alaska huckleberry provides moderate quality browse which becomes important when snow covers the ground. Wintergreen and trailing blackberry provide quality browse on many sites. The well-developed forb layer provides additional forage. Bunchberry dogwood, beargrass, twinflower, and fireweed are all readily grazed by herbivores.

These sites are primarily in the open sapling-pole stand condition. The mix of low and tall shrubs and young trees creates diverse cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging substrate for a variety of songbirds. On some sites, rocks provide cover for small mammals and reptiles. Huckleberry, trailing blackberry, and bunchberry dogwood provide fruit that attracts many species of wildlife including songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Fireweed provides seeds for small mammals and nectar for hummingbirds.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Many of the sites had no snags. Those snags that were present were generally less than 6 inches dbh. Down wood occurred at moderate levels in a diversity of size classes. Remnant logs greater than 20 inches were found on most sites. Wildlife dependent on snags would be rare on these sites as existing snags are too small. Species dependent on logs would not be abundant but should occur on many of these sites. Current harvest practices leave more large woody debris; thus, the Alaska huckleberry-Rhododendron sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
The Rhododendron community also has large amounts of rhododendron present, but differs in that it lacks Alaska or ovalleaf huckleberry, or

has only minor amounts. In the Rhododendron community, both big huckleberry and beargrass are more common and, on average, more abundant than in the Alaska huckleberry-Rhododendron community. Forb compostion is very similar between the two. The Rhododendron community usually indicates drier plant associations (predominantly Pacific silver fir/Rhododendron/Beargrass and Pacific silver fir/Rhododendron/Dwarf Oregongrape) than the Alaska huckleberry-Rhododendron community (which is predominantly Pacific silver fir/Alaska huckleberry/Dogwood bunchberry and Pacific silver fir/Rhododendron-Alaska huckleberry/Dogwood bunchberry).

Plant Association Predictability:
The Alaska huckleberry-Rhododendron community was quite wide-spread, being found in seven plant associations. Of these seven, the most common were Pacific silver fir/Alaska huckleberry/Dogwood bunchberry, Pacific silver fir/Rhododendron-Alaska huckleberry/Dogwood bunchberry, and Pacific silver fir/Rhododendron/Beargrass. These three associations occur in the "middle" range of both moisture and temperature for the Silver Fir zone.

The best way to determine the parent plant association is to visit a nearby mature stand. The following table and key may be useful to confirm determinations, or in cases where nearby stands are difficult to find.

1. Alaska/Ovalleaf huckleberry ≥ 20% ... 1a.
   1a. Rhododendron ≥ 20% ----------> Pacific silver fir/Rhododendron-Alaska huckleberry/Dogwood bunchberry

1a. Rhododendron < 20% ----------> Pacific silver fir/Rhododendron/Beargrass

1. Alaska/Ovalleaf huckleberry < 20% ... 2
   2. Rhododendron ≥ 20% ----------> Pacific silver fir/Rhododendron-Alaska huckleberry/Dogwood bunchberry

   2. Rhododendron < 20% ... 3

3. Wintergreen not present, big huckleberry rare----------> Pacific silver fir/Alaska huckleberry/Dogwood bunchberry

3. Wintergreen present, big huckleberry often present----------> Pacific silver fir/Rhododendron/Beargrass

Common Shrubs and Forbs
(%cover/%constancy)

# Plots	Plant Association	VAAL	RHMA	VAME	GAOV	EPAN	COCA	ANMA
8	ABAM/RHMA-VAAL/COCA	27/100	40/100	0/0	13/80	3/63	5/88	+/38
8	ABAM/VAAL/COCA	28/100	6/100	0/0	0/0	4/88	19/100	2/88
5	ABAM/RHMA/XETE	12/100	8/100	2/80	2/80	9/100	8/40	2/100
2	ABAM/VAAL/GASH	28/100	13/100	0/0	0/0	30/50	28/100	+/50
1	ABAM/TIUN	7/100	15/100	0/0	10/100	+/100	0/0	+/100
1	ABAM/RHMA/BENE	7/100	2/100	0/0	2/100	6/100	4/100	1/100
1	ABAM/VAME/XETE	5/100	1/100	5/100	10/100	+/100	0/0	+/100

+ = Trace amount

Early Seral Pathways:
The Alaska huckleberry-Rhododendron community may follow the Fireweed or Thimbleberry/Fireweed community on a few sites in the Pacific silver fir/Rhododendron/Beargrass plant association, but primarily it appears to develop initially; the only other community with a similar amount of Alaska huckleberry is the Devil's club/Oregon oxalis community, which occurs on different plant associations.

Big huckleberry/Beargrass
Vaccinium membranaceum/Xerophyllum tenax
VAME/XETE

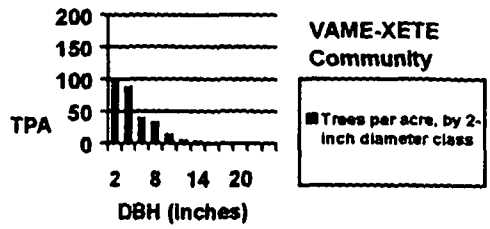
11 plots, located on 9 sites

Vegetation: Structure and Composition:
Small trees are generally well represented. Big huckleberry (VAME) dominates the shrub layer, with wintergreen (GAOV), pinemat manzanita (ARNE), and dwarf bramble (RULA) also abundant. Beargrass (XETE) dominates the sparse herb layer. ARNE and fireweed (EPAN) are the most common invaders, occurring on about half the sites.

Species	Code	% Constancy	% Cover
Shrubs:			
Big huckleberry	VAME	100	10
Wintergreen	GAOV	55	+
Dwarf bramble	RULA	46	4
Pinemat manzanita*	ARNE	36	7
Rhododendron	RHMA	36	2
Forbs:			
Beargrass	XETE	100	21
Fireweed*	EPAN	46	+
Nine-leaved anemone	ANLY2	18	+
Queencup beadlily	CLUN	18	+

*= Invading species
+ = Trace present

Douglas-fir (PSME), mountain hemlock (TSME) and Pacific silver fir (ABAM) are the most common tree species, each occurring on over 70 percent of plots. Six other species were found in smaller amounts. Most trees are 6 inches dbh or less, and stocking is fairly low, averaging a total of about 270 trees per acre.

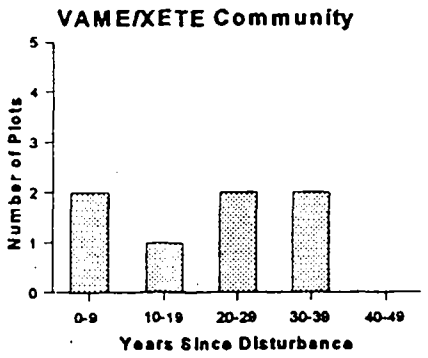


Elevation (ft.):	4020 (3800-4400)
Common Aspects:	Northerly
Slope (%):	11 (0-25)
Topographic Position:	Mostly ridgetops and benches

Environment and Distribution:
The Big huckleberry/Beargrass community occurs on the cold, dry end of the Pacific Silver Fir Zone, on sites with relatively low productivity. The majority of sites (7 of 9) are located east of the Cascade crest, in the Middle Fork Hood River and White River watersheds. One site each is located in the Collawash River and Upper Clackamas River watersheds. The average elevation of 4020 feet makes this one of the highest Pacific silver fir early seral communities.

Management Information: (7 sites)

Age since regeneration harvest can vary a great deal in this early seral community. Fuel treatments consisted mostly of piling and burning; two units were broadcast burned.
Burn intensities were noted as light to moderate.



Management Considerations:
The Big huckleberry/Beargrass community occurs on cold, high elevation sites that are relatively low in productivity. Although Douglas-fir is common (probably through planting), a component of western larch, western white pine, and other species can be left during thinnings to improve species diversity, and to minimize potential for snow breakage. The shrub and herb layers are relatively species-poor (Big huckleberry/Beargrass had the smallest number of species recorded of all early seral communities). However, big huckleberry occurs here more frequently than any other community. Big huckleberry/Beargrass sites are among the best choices for maintenance of huckleberry production.

Wildlife Habitat Relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderate but variable. Wildlife trails were observed on several plots. Big huckleberry provides high quality forage for ungulates and various other wildlife species. Wintergreen and pinemat manzanita provide low to moderate quality browse. The forb layer provides some forage. Beargrass and fireweed are readily grazed by herbivores. The tree and tall shrub layers provide a limited amount of hiding cover for ungulates and other large mammals.

These sites are primarily in the shrub to open sapling-pole stand condition. The shrub layer is not particularly dense but the mix of low and tall shrubs and young trees provides cover for a variety of birds and small mammals. Ground nesting birds and small mammals rely on the cover of low shrubs. Tall shrubs and trees provide nest sites and foraging habitat for a variety of songbirds. Big huckleberry, dwarf bramble, pinemat manzanita, and queencup beadlily provide fruit that attracts many species of wildlife including songbirds, grouse, quail, small mammals, bears, fox, coyotes, and raccoons. Lodgepole pine and western white pine provide high quality seeds for many species of birds and mammals. These species occur on some sites and will provide seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Snags were absent on many plots. Those snags that were present were generally at low densities and less than 10 inches dbh. Logs were usually less than 10 inches in diameter. Some remnant logs were greater than 15 inches, but logs greater than 20 inches were rare. Wildlife dependent on snags and down logs would be rare on these sites as existing coarse woody debris occurs at low densities and is too small. Current harvest practices leave more large woody debris; thus, the Big huckleberry/Beargrass sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
The lack of snowbrush on this community separates it from the Snowbrush/Beargrass (CEVE/XETE) community. Chinquapin/Beargrass (CACH/XETE) contains much larger amounts of CACH. The Big huckleberry/Beargrass community also lacks shrubs such as vine maple (ACCI), trailing blackberry (RUUR), and trailing snowberry (SYMO), and contains much less Oregon boxwood (PAMY), baldhip rose (ROGY), and dwarf Oregongrape (BENE) than the Chinquapin/Beargrass and Snowbrush/Beargrass communities. The Beargrass community contains large amounts of beargrass and big huckleberry; it also contains several pioneer specie not present on the Big huckleberry/Beargrass community, including thimbleberry (RUPA), woods and broadpetal strawberry (FRVE, FRVI), broadleaf lupine (LULA), and bracken fern (PTAQ). The presence of significant amounts of one or more of these species rules out the Big huckleberry/Beargrass community.

Plant Association Predictability:
The Big huckleberry/Beargrass community occurs primarily on the colder and drier associations in the Pacific Silver Fir Zone, with 9 of the 11 plots located in the Pacific silver fir/Big huckleberry/Beargrass (ABAM/VAME/XETE) or Pacific silver fir/Rhododendron/Beargrass (ABAM/RHMA/XETE associations. These two most common associations can be differentiated by the presence of rhododendron, and the amount of big huckleberry present. All Pacific silver fir/Rhododendron/Beargrass plots contained some amount of rhododendron, while none of the Pacific silver fir/Big huckleberry/Beargrass plots contained any. The following table and key may help:

		Common Shrubs and Forbs (%cover/%constancy)				
# Plots	Plant Association	VAME	RHMA	GAOV	XETE	EPAN
5	ABAM/VAME/XETE	11/100	0/0	+/40	13/100	+/80
4	ABAM/RHMA/XETE	11/100	2/100	1/75	33/100	0/0
1	ABAM/BENE	+/100	0/0	1/100	25/100	+/100
1	ABAM/VAME/CLUN	15/100	0/0	0/0	15/100	0/0

+ = Trace amount

1. Rhododendron present.....1a
   - 1a Beargrass cover > 15%.....> Pacific silver fir/Rhododendron/Beargrass
   - 1a Beargrass cover 15% or less.....> Pacific silver fir/Big huckleberry/ Queencup beadlily

1. Rhododendron absent.....2

2. Big huckleberry cover ≥ 0.5%.....> Pacific silver fir/Big huckleberry/Beargrass

2. Big huckleberry cover < 0.5%.....> Pacific silver fir/Dwarf Oregongrape

Early Seral Pathways:
The Big huckleberry/Beargrass community most likely develops early and persists; sample sites contained stands that were both very young and very old. The virtual absence of fireweed on the Big huckleberry/Beargrass community indicates that it probably does not follow the Fireweed community. The lack of other pioneer species such as snowbrush, thimbleberry, woods strawberry, broadpetal strawberry, and bracken fern, plus trace occurrence of pearly everlasting indicate that the Big huckleberry/Beargrass community probably does not follow other communities.

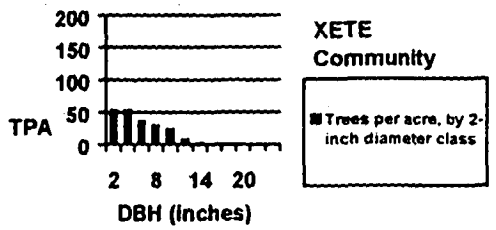
Beargrass
Xerophyllum tenax
XETE

42 plots, located on 26 sites

Vegetation: Structure and Composition: The shrub layer is generally low and sparse, with big huckleberry (VAME) being very common, and pinemat manzanita (ARNE) present half the time. Beargrass (XETE) dominates the forb layer. Two or more invader forbs, fireweed (EPAN), pearly everlasting (ANMA), broadleaf lupine (LULA), or bracken fern (PTAQ) are present. Carex species are fairly common, and can be heavy in some cases, particularly California sedge (CACA2). Douglas-fir (PSME), noble fir (ABPR), mountain hemlock (TSME), western white pine (PIMO), and Pacific silver fir (ABAM) all occur on over half of the sample plots. Eight other species are present is smaller amounts. Stands are open, lightly stocked and relatively small on these cold sites. Cover of trees > 12 feet tall averages 15 percent.

Species	Code	% Constancy	% Cover
Shrubs:			
Big huckleberry	VAME	98	6
Pinemat manzanita*	ARNE	50	2
Dwarf bramble	RULA	41	4
Wintergreen	GAOV	36	4
Rhododendron	RHMA	33	3
Forbs:			
Beargrass	XETE	98	6
Fireweed*	EPAN	96	2
White Hawkweed	HIAL	62	1
Pearly Everlasting*	ANMA	60	2
Broad-leaved Lupine*	LULA	55	3

* = Invading Species

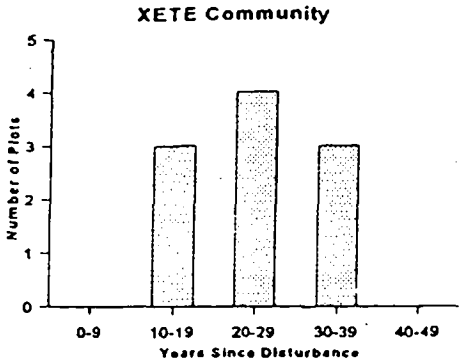


Environment & Distribution: The Beargrass community occurs mainly on the cold end of the Pacific Silver Fir Zone, mostly in the Pacific silver fir/Big huckleberry/queencup (ABAM/VAME/CLUN) and Pacific silver fir/Big huckleberry/Beargrass (ABAM/VAME/XETE) plant associations. This community has the highest average elevation of any Pacific Silver Fir Zone early seral community. Sampling sites were located in the Collawash, Middle and West Fork Hood River, Oak Grove Fork, South Fork, Upper Clackamas, and White River watersheds.

Elevation (ft.):	4123 (3500-4650)
Common Aspects:	Aspects are variable
Slope (%):	15 (0-40)
Topographic Position:	Mid and upper slopes, ridgetops and benches

Management information: (13 sites)

Ages since regeneration harvest varied greatly. Fuel treatments were predominantly broadcast burns, with some piling and yarding of unmerchantable material. Burn intensities were variable.



Management Considerations:
The Beargrass community is most common on the Pacific silver fir/Big huckleberry/beargrass (ABAM/VAME/XETE) and Pacific silver fir/Big huckleberry/Queencup beadlily (ABAM/VAME/CLUN) plant associations, which are relatively low in productivity for the Pacific Silver Fir Zone. Frost can be a severe problem on many sites. Frost-tolerant species, such as western white pine, should be retained during thinnings. Huckleberry production (VAME) may be good on some sites. Quality of special forest products may be poor in these cold, open environments.

Wildlife habitat relationships:
Observed wildlife use (i.e., evidence of browse) of these sites was moderate. Wildlife trails were observed on a few plots. Small amounts of big huckleberry provide the only high quality browse. Pinemat manzanita, dwarf bramble, and wintergreen provide low to moderate quality browse in small amounts. The forb layer provides some additional forage. Beargrass, fireweed, hawkweed, and lupine are readily grazed by herbivores. Density of tall shrubs and trees is usually not high enough to provide hiding or thermal cover for ungulates or other large mammals; foraging would be the primary use in this community.

These sites are primarily in the shrub to open sapling-pole stand conditions. The shrub layer is relatively sparse and consists mostly of low shrubs. Ground nesting birds and small mammals use cover of low shrubs. Tall shrubs are uncommon, thus songbirds that nest and forage in tall shrubs would be rare. Big huckleberry, pinemat manzanita, and dwarf bramble produce fruit used by a variety of wildlife, but the cover of these shrubs is fairly low. Fireweed and lupine provide seeds for small mammals and nectar for hummingbirds. Lodgepole pine and western white pine provide high quality seeds for many species of birds and mammals. These species occur on some sites and will provide seeds as the trees mature and begin producing cone crops.

The amount and size of large snags and logs is dependent on the amount left after harvest and site preparation. Snags were absent on many plots. Those snags that were present were generally at low densities and less than 10 inches dbh. Remnant snags greater than 20 inches were rare. Down wood occurred at moderate densities. Logs were generally less than 15 inches dbh. Most plots had a few remnant logs greater than 20 inches in diameter. Wildlife dependent on snags would be rare on these sites as existing snags are too small. Species dependent on logs would not be abundant but should occur on many of these

sites. Current harvest practices leave more large woody debris; thus the Beargrass community sites should contain more snags and down wood in the future. As a result, snag and log dependent wildlife should be more abundant in this community in the future.

Similar Early Seral Communities:
This community may appear similar to the Fireweed community, which in some cases may precede it. The Fireweed community is generally younger, with a less established tree layer. The Fireweed community may also have a significant amount of beargrass present; however, it differs from the Beargrass community in having heavier amounts of fireweed, usually over 10% cover.
The Beargrass community differs from the Twinflower-Beargrass community, by lacking significant amounts of twinflower and having a less developed shrub layer.
The Big huckleberry/Beargrass community may be closely related to the Beargrass community. Both are dominated by beargrass and big huckleberry, and have similar tree canopy development. The Big huckleberry/Beargrass community is different in that it is much more "floristically simple" and has far fewer species present. In particular the Big huckleberry/Beargrass community has minor to no representation of invader species (except pinemat manzanita).

Plant Association Predictability:
Although this community was found across seven plant associations, most plots occurred in two associations: Pacific silver fir/Big huckleberry/Beargrass (ABAM/VAME/XETE), and Pacific silver fir/Big huckleberry/Queencup beadlily (ABAM/VAME/CLUN).

Common Shrubs and Forbs
(%cover/%constancy)

# Plots	Plant Association	VAME	ARNE	XETE	EPAN
16	ABAM/VAME/XETE	7/100	3/50	20/100	2/100
14	ABAM/VAME/CLUN	5/93	2/43	15/100	3/100
5	ABAM/RHMA/XETE	3/100	+/40	25/100	1/100
2	ABAM/MEFE	20/100	1/50	25/100	1/100
2	ABAM/VAAL/COCA	1/100	4/100	35/100	+/100
2	ABAM/BENE	3/100	1/100	25/100	+/100
1	ABAM/TIUN	+/100	0/0	5/100	+/100

(+ = trace)

It is difficult to see any clear pattern that would predict one association over another. However, Pacific silver fir/Big huckleberry/Beargrass and Pacific silver fir/Big huckleberry/Queencup beadlily often (but not always) have California sedge (CACA2) present, sometimes in heavy amounts. Sedges are minor to rare in the other associations (within this community).

Early Seral Pathways:

The Beargrass community develops very early, even though the average stand age is mid-range for early seral plant communities. Cold sites and slow growing conditions contribute to delayed development of the tree layer.

Beargrass is most likely an initial community, but may follow the Fireweed community on colder sites, where fire and other disturbance allowed colonizing fireweed to become dominant on the site. It may also be followed by the Big huckleberry/Beargrass community, on sites where big huckleberry is present and increases in cover over time, or by the Rhododendron community on sites with significant amounts of rhododendron.

Mt. Hood National Forest
Early Seral Guide, Pacific Silver Fir Zone
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Appendices

Appendix 1

Mt. Hood National Forest
Seral Vegetation Communities
Pacific Silver Fir Zone

	EPAN	XETE	VAME/ XETE	CEVE/ XETE	CACH/ XETE	CEVE-CACH	CACH-PAMY	ACCI-PAMY	RHMA	VAAL-RHMA	VAAL-ACCI/ COCA	RUPA/ EPAN	PTAQ-PEEU	BENE/ FRAGA	OPHO/ OXOR	LIBO-XETE	
TM CLASS[1]	1.3	2.3	2.5	2.4	2.9	2.8	3.6	2.6	2.5	2.7	3.4	2.9	3.1	3.3	4.0	3.3	TM CLASS
AGE	18	27	23	18	28	29	34	(23)	25	35	32	24	35	-	26	32	AGE
TM COVER[2] (Con/Cov)	33/6	90/16	100/16	100/14	97/23	96/22	100/33	100/21	89/19	88/22	94/34	94/31	100/21	100/26	100/40	100/28	TM COVER (Con/Cov)
TR COVER[3]	10	9	8	6	9	6	8	6	7	14	8	10	8	8	9	8	TR COVER
BURN INT[4]	2	2	1	1	1	2	2	1	1	1	0	2	1	1	-	1	BURN INT
FUEL TRMT[5]	FBR	FBR	FPB	FBR	FBR	FBR	FPB	(FPB)	FBR/ FPB	FBR	FND/ FBR	FBR/ FND	FBR	-	FPB	FBR	FUEL TRMT[5]
ELEV	3644	4123	4020	3880	3837	4023	3929	3773	3623	3411	3200	3647	3994	3086	2913	3741	ELEV
SLOPE	31	15	11	8	17	16	10	35	28	26	20	44	16	13	(42)	21	SLOPE
ASPECT								SE-SW				SE-SW					ASPECT
SHRUB	24	17	18	48	34	59	44	63	54	59	58	46	18	21	85	44	SHRUB
FORB	36	21	22	16	16	11	22	12	19	31	18	24	31	17	32	(41)	FORB
# PLOTS	13	42	11	18	31	26	7	11	18	26	17	17	24	7	16	12	# PLOTS
ABAM/BENE	2	2	1	6	14	17	3	2	3		3	7	3	5			ABAM/BENE
ABAM/RHMA/XETE	6	5	4		3	1		3	23	5		4				7	ABAM/RHMA/XETE
ABAM/VAME/XETE	1	16	5	8	11	2		3	2	1	1	2				1	ABAM/VAME/XETE
ABAM/VAME/CLUN	1	14	1	4	2	2	4		2		5		21				ABAM/VAME/CLUN
ABAM/VAAL/COCA	3	2								8	5				2	1	ABAM/VAAL/COCA
ABAM/RHMA-BENE						1		3	6	1	3	1		2		1	ABAM/RHMA-BENE
ABAM/RHMA-VAAL/COCA										8							ABAM/RHMA-VAAL/COCA
ABAM/VAAL-GASH										2					8		ABAM/VAAL-GASH
ABAM/MEFE		2													3	2	ABAM/MEFE
ABAM/ACCI/TIUN						3						2					ABAM/ACCI/TIUN
ABAM/TIUN	1	1			1				2	1		1					ABAM/TIUN
ABAM/OXOR	1														3		ABAM/OXOR

[1] TM Class: 1= < 5% cover in trees > 12 feet tall
2= 5-15% cover in trees >12 feet tall
3= 15-30% cover in trees >12 feet tall
4= 30-60% cover in trees >12 feet tall
5= >60% cover in trees >12 feet tall

[2] TM Cover: Constancy and cover of trees > 12 feet tall

[3] TR Cover: Cover of trees < 12 feet tall

[4] Burn Int: Burn intensity
0= none
1= light
2= moderate
3= intense

[5] Fuel TRMT:
FBR= Broadcast burn
FPB= Pile and Burn
FND= No treatment

Appendix 2
Cover and Constancy of Common Plants

	COMMUNITY																											
	EPAN		XETE		VAME/ XETE		CEVE/ XETE		CACH/ XETE		CEVE- CACH		CACH- PAMY		ACCI- PAMY		RHMA		VAAL- RHMA		VAAL- ACCI/C		RUPA/ EPAN		PTAQ- PEEU		BENE/ FRAGA		OPHO/ OXOR		LIBO2- XE
INVADING																														
SHRUBS/HERBS	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	COV	CON
ARNE			2	50	7	36	7	61	9	48	6	31			1	9	4	26	3	4	2	18			3	8	2	14			3	58
CEVE			2	17			19	100	2	10	18	100	2	43	2	27									1	29					2	25
RUPA	2	53	1	12			+	6	1	10	1	46	+	29	6	55	2	24	3	31	2	59	15	94	1	33			9	63	2	33
ANMA	5	80	1	60	+	9	1	78	1	48	1	42	+	29	1	46	2	63	1	73	1	65	2	65	2	50	2	86	2	81	2	83
EPAN	26	100	2	98	+	46	1	94	1	81	1	50	+	14	3	64	3	84	6	81	3	77	11	77	1	29	2	100	4	88	2	83
FRVE			4	17			1	6	+	3	1	27	5	43	+	9	1	5	2	4	5	24	2	29	3	42	18	86			2	25
FRVI			1	14			2	22			4	15	5	43							3	12	6	24	5	71	11	29	+	6	15	17
LULA	2	40	3	55			1	44	2	16	2	4	+	43	1	36	2	32	3	19			2	53	2	79			+	6	1	25
PEEU																									14	63						
PTAQ	2	13	4	14			3	33	2	29	9	54	16	71	2	36	4	8	3	15	9	59	8	24	23	71	+	14	1	31	8	67
RESIDUAL																														
SHRUBS/HERBS	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	COV	CON
ACCI	12	40	1	14			4	39	10	16	7	62			17	100	3	32	3	27	31	71	6	82	4	13					17	81	2
BENE	2	67	1	17	+	18	3	78	2	65	2	62	1	86	3	82	3	53	3	39	3	41	1	47	1	13	7	100	14	19	3	67
CACH	3	13	2	14	2	18	6	61	13	97	11	65	22	100	7	82	7	47	2	8	+	6	+	6	2	17	+	14			1	58
CHUM	+	7	1	24	2	18	+	39	3	77	2	19	2	71	4	46	1	29	1	8	1	18	1	12	2	8	1	43			2	58
GAOV	2	20	4	36	1	55	5	44	5	65	1	19			4	36	10	74	7	42	5	35	+	6	+	4	1	29			5	100
OPHO																			+	4	+	18							5	81		
PAMY	4	47	5	31	+	9	5	78	2	32	12	85	5	100	14	100	4	50	7	19	3	18	2	47	2	42	1	57	+	6	5	75
RHMA	3	60	3	33	2	36	13	11	4	23	25	4			3	27	26	100	17	100	1	24	3	24			1	43	3	31	2	83
ROGY	+	7	+	12	+	9	1	44	1	36	1	46	1	86	4	9	1	11	1	4	1	53	1	59	2	63	4	100	2	13	1	75
RULA	5	33	4	41	4	46	2	33	+	13	1	15	2	57	8	27	5	32	7	58	5	41	4	35	1	33	1	29	2	31	4	67
RUUR	4	67	1	31			4	78	2	48	5	92	1	57	8	73	5	50	5	42	8	88	4	88	8	17	3	100	17	69	5	83
SYMO	1	20	1	19			5	44	2	13	4	27	3	43	3	18	1	5	+	4	7	18	14	65	6	46	3	13			4	25
SYMPH							+	6			5	35	8	29			1	8			3	12			8	38	+	29				
SYAL																							3	18							2	25
VAAL	3	27	1	7					2	3					+	9	2	16	23	92	9	41	1	6					30	81	+	8
VAOV			3	2	+	9			2	3									6	8	11	35	+	6	+	4			5	6	4	33
VAME	5	53	6	98	10	100	2	78	4	90	2	19	2	71	7	36	5	79	2	23	7	41	4	59	2	54	1	71	2	13	8	92
VAPA	+	13	+	10					+	7					4	36	2	29	5	35	4	47	2	18			1	14	7	69	2	33
ACTR	1	27	1	10	3	9	1	17	20	10	+	8	1	71	+	18			+	15	3	47	2	47	3	38			2	31	15	8
BLSP	+	13																	3	19	1	6							5	69	+	8
CASC2	2	7	2	7					+	3	1	12	2	29	1	18	+	5	+	4	1	29	1	29	1	54	1	14	1	19	5	42
CLUN	2	27	1	10	+	18	1	17	1	19	+	8	3	71			1	3	4	39	1	53	1	18	1	17			4	50	2	25
COCA	3	47	1	19			+	6	1	19	+	12			1	18	9	29	13	77	12	100	2	41	2	13	7	71	18	75	6	58
HIAL	1	80	1	62	1	9	1	61	2	19	1	39	1	43	2	46	1	55	2	46	1	59	1	59	1	75	1	100	2	50	1	58
LIBO2	+	20	1	31	1	9	6	55	9	71	4	27	5	71	9	64	7	29	7	50	7	59	4	35	1	13	2	29	18	31	16	100
OXOR	2	20																	1	4	+	6							20	88		
SMST	1	20	+	10							+	4	1	43	8	18			20	15	4	77	1	47	1	42			8	75	3	33
TITRU	+	7																	+	4	1	24	+	6	+	4			5	75	+	8
TRLA2	1	27			+	9	1	11	3	7	1	62	+	14	4	91	1	13	+	4	+	18	2	53	2	42	+	14	+	6	2	33
VAHE	7	33	1	7							1	8			5	9	+	3	25	4	2	65	6	47			+	14	5	56	3	42
XETE	6	40	20	100	21	100	12	100	9	100	2	23	2	43	5	73	13	100	10	69	4	24	1	18			1	86			25	100

	EPAN		XETE		VAME-XETE		CEVE-XETE		CACH-XETE		CEVE-CACH		CACH-PAMY		ACCI-PAMY		RHMA		VAAL-RHMA		VAAL-ACCI/C		RUPA-EPAN		PTAQ-PEEU		BENE-FRAGA		OPHO-OXOR		LIBO2-XI
TREES	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	CV	CON	COV	CO

PSMEM	5	27	10	67	9	73	11	94	10	90	13	85	9	57	17	91	11	68	11	81	21	88	25	82	8	88	17	100	20	94	14	100
PSMER	8	87	1	76	1	55	2	78	1	81	1	62	1	71	2	55	2	58	3	85	1	47	3	82	2	67	1	57	3	81	2	41
TSMEM			4	10	3	82	+	11	4	52	1	15	1	14	2	27	4	18	1	12	1	6	2	6	1	13					2	42
TSMER			2	67	2	73	1	39	3	65	1	31	1	57	1	18	2	32	3	31	1	24	1	18	1	29	+	29			1	58
ABAMM	1	13	6	33	7	73			9	36			7	29	3	36	6	61	6	50	3	29	3	24	2	17			6	50	8	58
ABAMR	1	20	3	50	5	73	+	11	2	39	3	19	2	43	1	36	3	61	3	62	1	41	1	35	2	29	+	29	2	31	2	42
TSHEM			2	24			3	17	4	58	2	19	3	57	5	46	4	50	8	58	6	82	6	35	3	8	1	14	12	100	6	50
TSHER	1	53	1	41	1	46	1	33	2	61	2	23	1	57	2	64	2	66	5	92	3	88	1	88	+	33	+	100	4	100	1	67
ABGRM									2	13	3	19	4	57									20	6	3	29						
ABGRR			1	7			+	6	1	19	1	46	3	100									10	6	2	67						
PIPOM			1	5	2	9			1	7	16	19	13	57			2	3							11	42	2	14			2	8
PIPOR					+	9	1	6	+	3	+	8													1	8						

Appendix 3. Wildlife species associated with early seral habitats in the Pacific Silver Fir Zone, Mt. Hood National Forest.

			STAND CONDITIONS USED [2]			HABITAT FEATURES USED [3]		
Common Name	Scientific Name	Life Form[1]	Grass/forb	Shrub	Open Sap/pole	Snags	Down Wood	Rock/Talus
AMPHIBIANS								
Northwestern salamander	*Ambystoma gracile*	2	F	F	F		F	
Long-toed salamander	*Ambystoma macrodactylum*	2	F	F	F		F	
Pacific giant salamander	*Dicamptodon tenebrosus*	2			F		B	
Clouded salamander	*Aneides ferreus*	5	B	B	B	B	Br	B
Oregon slender salamander	*Batrachoseps wrighti*	5	B	B	B		Br	B
Ensatina	*Ensatina eschscholtzii*	5	B	B	B		B	B
Rough-skinned new	*Taricha granulosa*	2	F	F	F		F	
Western toad	*Bufo boreas*	2	F	F	F		F	
Pacific treefrog	*Pseudacris regilla*	2	F	F	F		F	
Cascades frog	*Rana cascadae*	2	F	F	F			
BIRDS								
Turkey vulture	*Cathartes aura*	4	B	B		F	B	
Bald eagle	*Haliaeetus leucocephalus*	12	F			F		
Sharp-shinned hawk	*Accipiter striatus*	11			B	F	F	
Cooper's hawk	*Accipiter cooperii*	11	F	F	B	F	F	
Northern goshawk	*Accipiter gentilis*	11	F			F	F	
Red-tailed hawk	*Buteo jamaicensis*	12	F	F		F		
Golden eagle	*Aquila chrysaetos*	12	F	F		F		
American kestrel	*Falco sparverius*	14	F	F		Br		
Merlin	*Falco columbarius*	11	F	F	F	F		
Peregrine falcon	*Falco peregrinus*	4	F	F	F	F		
Blue grouse	*Dendragapus obscurus*	5	F	B	B		F	
Wild turkey	*Meleagris gallopavo*	5	F	F	F		Br	
Mountain quail	*Oreortyx pictus*	5	B	B	B			
Band-tailed pigeon	*Columba fasciata*	11	F	F	B			
Western screech-owl	*Otus kennicottii*	14	F	F	F	Br		
Great horned owl	*Bubo virginianus*	12	F	F	F	B		
Northern pygmy-owl	*Glaucidium gnoma*	14	F	F	F	Br		
Northern saw-whet owl	*Aegolius acadicus*	14	F	F	F	Br		
Common nighthawk	*Chordeiles minor*	6	B	B	F			B

Appendix 3 (con't).

Common Name	Scientific Name	Life Form[1]	STAND CONDITIONS USED[2]			HABITAT FEATURES USED[3]		
			Grass/forb	Shrub	Open Sap/pole	Snags	Down Wood	Rock/Talus
Vaux's swift	*Chaetura vauxi*	14	F	F	F	Br		
Rufous hummingbird	*Selasphorus rufus*	11	F	B	B			
Red-naped sapsucker	*Sphyrapicus nuchalis*	13			F	Br		
Red-breasted sapsucker	*Sphyrapicus ruber*	13			F	Br		
Hairy woodpecker	*Picoides villosus*	13	B	B	F	Br	F	
Northern flicker	*Colaptes auratus*	13	F	F	F	Br	F	
Pileated woodpecker	*Dryocopus pileatus*	13	F	F	F	Br	F	
Olive-sided flycatcher	*Contopus borealis*	10	F	F	F	F		
Western wood-pewee	*Contopus sordidulus*	11		F	F			
Hammond's flycatcher	*Empidonax hammondii*	11			B	F		
Dusky flycatcher	*Empidonax oberholseri*	8	F	B	B	F		
Tree swallow	*Tachycineta bicolor*	14	B	F	F	Br		
Violet-green swallow	*Tachycineta thalassina*	14	F	F	F	Br		
Barn swallow	*Hirundo rustica*	4	F	F				
Gray jay	*Perisoreus canadensis*	11			F			
Steller's jay	*Cyanocitta stelleri*	11		F	B		F	
Clark's nutcracker	*Nucifraga columbiana*	10	F	F	F			
American crow	*Corvus brachyrhynchos*	11	F	F	B			
Common raven	*Corvus corax*	4	F	F	F			
Mountain chickadee	*Parus gambeli*	14		F	F	Br	B	
Chestnut-backed chickadee	*Parus rufescens*	14		F	F	Br		
Red-breasted nuthatch	*Sitta canadensis*	13			F	Br	B	
Winter wren	*Troglodytes troglodytes*	14		F	F	B	B	
Golden-crowned kinglet	*Regulus satrapa*	10		F	F			
Ruby-crowned kinglet	*Regulus calendula*	10		F	F			
Mountain bluebird	*Sialia currucoides*	14	F	B	F	Br		
Townsend's solitaire	*Myadestes townsendi*	6	B	B	B		B	
Swainson's thrush	*Catharus ustulatus*	7		B	B			
Hermit thrush	*Catharus guttatus*	7		B	B			
American robin	*Turdus migratorius*	11	F	B	B			

Appendix 3 (con't).

Common Name	Scientific Name	Life Form[1]	STAND CONDITIONS USED[2]			HABITAT FEATURES USED[3]		
			Grass/forb	Shrub	Open Sap/pole	Snags	Down Wood	Rock/Talus
Varied thrush	*Ixoreus naevius*	11		F	F			
Cedar waxwing	*Bombycilla cedrorum*	9		F	F			
Solitary vireo	*Vireo solitarius*	11			B			
Warbling vireo	*Vireo gilvus*	11			B			
Orange-crowned warbler	*Vermivora celata*	6		B	B			
Nashville warbler	*Vermivora ruficapilla*	6		B	B			
Yellow-rumped warbler	*Dendroica coronata*	10		B	B			
Macgillivray's warbler	*Oporornis tolmiei*	8		B	B			
Wilson's warbler	*Wilsonia pusilla*	6		B	B			
Western tanager	*Piranga ludoviciana*	10		F	F			
Chipping sparrow	*Spizella passerina*	11	F	B	B			
Fox sparrow	*Passerella iliaca*	7		B	B			
Lincoln's sparrow	*Melospiza lincolnii*	6	F	B				
White-crowned sparrow	*Zonotrichia leucophrys*	7	B	B	B			
Dark-eyed junco	*Junco hyemalis*	5	F	B	B		B	
Brown-headed cowbird	*Molothrus ater*	7	F	B	B			
Pine grosbeak	*Pinicola enucleator*	11		F	B			
Red crossbill	*Loxia curvirostra*	10			F			
Pine siskin	*Carduelis pinus*	11	F	F	B			
Evening grosbeak	*Coccothraustes vespertinus*	11		F	F			
MAMMALS								
Vagrant shrew	*Sorex vagrans*	15	B	B	B		B	
Baird's shrew	*Sorex bairdii*	15	B	B	B		B	
Dusky shrew	*Sorex monticolus*	15	B	B	B		B	
Shrew-mole	*Neurotrichus gibbsii*	15			B		B	
Townsend's mole	*Scapanus townsendii*	15	B	B	B		B	
Coast mole	*Scapanus orarius*	15	B	B	B		B	
Little brown myotis	*Myotis lucifugus*	14	F	F	F	Br	B	
Long-eared myotis	*Myotis evotis*	14		F	F	Fr		
Fringed myotis	*Myotis thysanodes*	14	F	F	F	F		F
Long-legged myotis	*Myotis volans*	14	F	F	F	Br		

Appendix 3 (con't).

	STAND CONDITIONS USED[2]			HABITAT FEATURES USED[3]		

Common Name	Scientific Name	Life Form[1]	Grass/forb	Shrub	Open Sap/pole	Snags	Down Wood	Rock/Talus
California myotis	*Myotis californicus*	14	F	F	F	Fr	B	
Western small-footed myotis	*Myotis ciliolabrum*	14	F	F	F			B
Silver-haired bat	*Lasionycteris noctivagans*	14	F		F	Br		
Big brown bat	*Eptesicus fuscus*	14	F		F	Br		
Hoary bat	*Lasiurus cinereus*	11		F	F	Fr		
Townsend's big-eared bat	*Plecotus townsendii*	4	F	F	F			
Pika	*Ochotona princeps*	4	F	F			B	Br
Brush rabbit	*Sylvilagus bachmani*	5	B	B	B			
Snowshoe hare	*Lepus americanus*	5	F	B	B		B	
Mountain beaver	*Aplodontia rufa*	15	B	B	B		B	
Yellow-pine chipmunk	*Tamias amoenus*	15	B	B	B	B	B	B
Townsend's chipmunk	*Tamias townsendii*	15		B	B	B	B	B
Yellow-bellied marmot	*Marmota flaviventris*	4	B			B		Br
California ground squirrel	*Spermophilus beecheyi*	15	B	B				
Golden-mantled ground squirrel	*Spermophilus lateralis*	15	B	B	B		B	B
Northern pocket gopher	*Thomomys talpoides*	15	B					
Western pocket gopher	*Thomomys mazama*	15	B	B				
Deer mouse	*Peromyscus maniculatus*	15	B	B	B	B	B	B
Bushy-tailed woodrat	*Neotoma cinerea*	5		B	B	B	B	Br
Heather vole	*Phenacomys intermedius*	15	B	B			B	
Townsend's vole	*Microtus townsendii*	15	B	B	B			
Long-tailed vole	*Microtus longicaudus*	15	B	B	B		B	B
Creeping vole	*Microtus oregoni*	15	B	B	B		B	
Pacific jumping mouse	*Zapus trinotatus*	3	B	B	B		B	
Porcupine	*Erethizon dorsatum*	6	F	B	B	B	B	
Coyote	*Canis latrans*	15	B	B	B		B	
Red fox	*Vulpes vulpes*	15	B	B	B		B	B
Black bear	*Ursus americanus*	15	F	F	B	B	B	F
Raccoon	*Procyon lotor*	14	B	B	B	B	F	
Fisher	*Martes pennanti*	14		F		B	B	B

Appendix 3 (con't).

			STAND CONDITIONS USED [2]			HABITAT FEATURES USED [3]		
Common Name	Scientific Name	Life Form[1]	Grass/forb	Shrub	Open Sap/pole	Snags	Down Wood	Rock/Talus

Ermine	*Mustela erminea*	15	F	B	B	B	B	B
Long-tailed weasel	*Mustela frenata*	15	B	B	B	B	B	B
Mink	*Mustela vison*	14	B	B	B		B	B
Western spotted skunk	*Spilogale gracilis*	15	B	B	B	B	B	F
Mountain lion	*Felis concolor*	4	F	B	B		B	B
Bobcat	*Felis rufus*	4	F	B	B	B	B	B
Elk	*Cervus elaphus*	5	F	B	B			
Black-tailed & mule deer	*Odocoileus hemionus*	5	B	B	B		F	
REPTILES								
Northern alligator lizard	*Elgaria coerulea*	5	B	B	B		B	B
Western fence lizard	*Sceloporus occidentalis*	5	B	B	B		F	F
Western skink	*Eumeces skiltonianus*	3	B	B	B		B	B
Rubber boa	*Charina bottae*	5	B	B	B		B	
Racer	*Coluber constrictor*	5	B	B				
Ringneck snake	*Diadophis punctatus*	5	B	B	B		B	
Common garter snake	*Thamnophis sirtalis*	3	B	B	B		B	B

[1] See Appendix 4 for life form descriptions.

[2] B= breeding habitat, may also be used for foraging and resting habitat. F= non-breeding habitat, used for foraging and/or resting habitat.

[3] B and F use codes same as above. B and F - feature used - species use these features when available; Br and Fr - feature required - species may not occur unless these feature are present.

Appendix 4. Life form descriptions.

Life Form	Reproduces on or in:	Feeds on or in:	Number of species
2	water	ground, shrubs, trees	7
3	ground around water	ground, shrubs, trees, water	5
4	cliffs, caves, talus	ground, air	9
5	ground	ground	17
6	ground	shrubs, trees, air	7
7	shrubs	ground, water, air	5
8	shrubs	trees, shrubs, air	2
9	deciduous trees	trees, shrubs, air	1
10	conifer trees	trees, shrubs, air	7
11	conifer or deciduous trees	trees, shrubs, ground, air	20
12	very thick branches	ground, water	4
13	hole in tree or snag	trees, shrubs, ground, air	6
14	hole in tree or snag	ground, water, air	22
15	burrow underground	ground	24